

0000  
0001  
0002  
0003  
0004  
0005  
0006  
0007  
0008  
0009  
0010  
0011  
0012  
0013  
0014  
0015  
0016  
0017  
0018  
0019  
0020  
0021  
0022  
0023  
0024  
0025  
0026  
0027  
0028  
0029  
0030  
0031  
0032  
0033  
0034  
0035  
0036  
0037  
0038  
0039  
0040  
0041  
0042  
0043  
0044  
0045  
0046  
0047  
0048

B622	B88	0	00	B661	B642
B642	B88	0	00	B681	B662
B662	B88	0	00	B701	B682
B682	B88	0	00	B721	B702
B702	B88	0	00	B741	B722
B722	B88	0	00	B641	B622
B742	B88	0	30	B014	B802
B743	B88	0	30	B026	B802
B744	B88	0	30	B038	B802
B745	B88	0	30	B050	B802
B746	B88	0	30	B062	B802
B747	B88	0	30	B074	B802
B748	B88	0	30	B086	B802
B749	B88	0	30	B098	B802
B750	B88	0	30	B019	B802
B751	B88	0	30	B031	B802
B752	B88	0	30	B043	B802

BSAH  
INIT  
R0000  
D0000  
F0000  
C0000  
B0000  
E0000  
U0000  
V0000  
I0001  
J0001  
G0000

FLO

NEW1	00001
EQU	B999
BLR	4200
BLR	4000
COR	0200
COR	0200
COR	0201
COR	0020
COR	0080
COR	0040
COR	0020
COR	0020
COR	0020
HHH	
JMP	U0039
JMP	U0059
JMP	U0079
JMP	V0019
JMP	V0039
JMP	U0019
LDL	F0013
LDL	F0025
LDL	F0037
LDL	F0049
LDL	F0061
LDL	F0073
LDL	F0085
LDL	F0097
LDL	F0018
LDL	F0030
LDL	F0042

00000

4419  
4199

C

U0020
U0040
U0060
V0000
V0020
U0000
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R
TB1R

# 1. QADAAD ASSEMBLER PASS 1.

## TABLE OF CONTENTS

X C. COPY ROUTINE  
X G. GET NEXT CARD IMAGE ROUTINE  
X I. INITIALIZE ROUTINE  
X M. MASTER CONTROL ROUTINE  
X U. CARD BUFFER UNLOAD CO-ROUTINE  
X W. TAPE WRITE ROUTINE  
X THIS PASS READS CARDS ONTO TAPE, UPDATING  
X A PREVIOUS TAPE.  
X THE SHOW BEGINS AT ROUTINE I.

## ERROR STOPS

X M MEANING  
X 1 CARD READ COMPARISON ERROR  
X 2 HSR OFF NORMAL  
X 5 TAPE WRITE ERROR  
X 6 TAPE READ ERROR

G START  
G TAPE INPUT AREA  
G CARD READ AREA  
G FIRST STATION AREA  
G 2ND STATION AREA  
G TAPE OUTPUT AREA  
G CARD EDIT TARGET AREA  
G CARD BUFFERS  
G CARD BUFFERS  
G 1ST STATION UNLOAD TABLE  
G 2ND STATION UNLOAD TABLE  
G CURRENT INPUT CARD

G CARD INPUT BUFFER LINKS

G 1ST STATION UNLOAD CONTROL

**G 2ND STATION UNLOAD CONTROL**

```

1.  INITIALIZE.
11. STOP.
M:  HALT, IF M RESTART GO TONPAS2 (W6).
C:
12. SET STARTING VALUES
    SET LINE COUNT TO 0
    SET STACKER SELECT COUNT TO 0
    SET STACKER SELECT TO POCKET 0
    RESET OUTPUT BUFFER

```

```

      SET CURRENT TAPE INPUT LINE COUNT TO -10
      CLEAR CARD INPUT BUFFERS
13.  THEN GO
      TO MASTER CONTROL#M1.

```

U. UNLOAD SECTION  
U1. UNLOAD BUFFER  
FILL 2ND STATION AREA

U2. CHECK 2ND  
STATION EMPTY.  
EMPTY IF EMPTY, GO TO U5.  
FULL

0099	8828	888	0	05	8829	814A
0100	814A	888	1	08	0016	8830
0101	8830	888	1	04	8741	8741
0102	8802	888	1	04	8761	8761
0103	8829	888	0	82	8831	8832
0104	8831	888	1	06	9999	815A
0105	815A	888	0	31	8833	8833
0106	8833	888	0	82	8834	8830
0107	8834	888	0	07	0600	816A
0108	816A	888	0	77	816A	817A
0109	817A	888	0	07	0001	818A
0110	818A	888	0	70	8808	819A
0111	819A	888	0	60	8808	820A
0112	820A	888	0	82	8835	8836
0113	8835	888	0	26	8837	8837
0114	8837	888	0	60	8808	821A
0115	821A	888	0	75	8811	822A
0116	822A	888	0	60	8811	8838
0117	8836	888	0	25	8811	8838
0118	8838	888	0	70	8839	000A
0119	8839	888	0	47	0050	4999
0120	4999	888	0	25	8207	823A
0121	823A	888	0	60	8621	824A
0122	824A	888	0	25	8212	825A
0123	825A	888	0	60	8620	826A
0124	826A	888	0	25	8391	827A
0125	827A	888	0	60	8619	828A
0126	828A	888	0	25	8396	829A
0127	829A	888	0	60	8618	830A
0128	830A	888	0	25	8379	831A
0129	831A	888	0	60	8617	832A
0130	832A	888	0	25	8384	833A
0131	833A	888	0	60	8616	834A
0132	834A	888	0	25	8367	835A
0133	835A	888	0	60	8615	836A
0134	836A	888	0	25	8372	837A
0135	837A	888	0	60	8614	838A
0136	838A	888	0	25	8355	839A
0137	839A	888	0	35	8840	8841
0138	8840	888	0	0H	HHHH	HHHH
0139	8841	888	0	60	8613	840A
0140	840A	888	0	25	8360	841A
0141	841A	888	0	35	8840	842A
0142	842A	888	0	60	8612	843A
0143	843A	888	0	05	8355	844A
0144	844A	888	0	25	8343	845A
0145	845A	888	0	32	0900	846A
0146	846A	888	0	25	000C	847A
0147	847A	888	0	37	0100	848A
0148	848A	888	0	60	8609	849A

U3	L0X	8F	
	LIRJ	0016	9F
9	JMPJ	10000	
TB1R	JMPJ	J0000	
8	TEQ		U6
	IIRJ	9999	
	CLL		
	TEQ	U4	9B
U4	IIR	0600	
	ATL		
	IIR	0001	
	ADD	SSCT	
	STA	SSCT	2F
	TEQ		
	CLA		
	STA	SSCT	
	SUB	SSW	
	STA	SSW	3F
2	LDA	SSW	3F
3	ADD		RA
	HSS	0050	4999
4999	LDA	C0006	
	STA	E0019	
	LDA	C0011	
	STA	E0018	
	LDA	C0190	
	STA	E0017	
	LDA	C0195	
	STA	E0016	
	LDA	C0178	
	STA	E0015	
	LDA	C0183	
	STA	E0014	
	LDA	C0166	
	STA	E0013	
	LDA	C0171	
	STA	E0012	
	LDA	C0154	
	ERS	9F	8F
9	CON	OHMMH	HHMMH
8	STA	E0011	
	LDA	C0159	
	ERS	9B	
	STA	E0010	
	L0X	C0154	
	LDA	C0142	
	SHR	0900	
	LDA	RX	
	SHL	0100	
	STA	E0007	

U3. COMPARE 2ND STATION  
WITH PREVIOUS 1ST STATION FOR CHECK.  
ERR:GO TOMU6 IF COMPARISON FAILS.  
OK:

U4. CHECK FOR 600 CARDS  
IF SO SWAP CARD POCKETS 0 AND 1

G WATCH OUT FOR UNDIGIT GARBLE  
U5. FILL INTERNAL BUFFER  
EDIT 2ND STATION TO E REGION  
SEE QADAAD PASS 2, SECTION E FOR OUTPUT  
FORMAT

0149	849A	888	0	05	8360	850A	LDX	C0159	
0150	850A	888	0	25	8348	851A	LDA	C0147	
0151	851A	888	0	32	0900	852A	SHR	0900	
0152	852A	888	0	25	000C	853A	LDA	RX	
0153	853A	888	0	37	0100	854A	SHL	0100	
0154	854A	888	0	60	8608	855A	STA	E0006	
0155	855A	888	0	05	8343	856A	LDX	C0142	
0156	856A	888	0	25	8331	857A	LDA	C0130	
0157	857A	888	0	32	0800	858A	SHR	0800	
0158	858A	888	0	25	000C	859A	LDA	RX	
0159	859A	888	0	37	0100	860A	SHL	0100	
0160	860A	888	0	60	8607	861A	STA	E0005	
0161	861A	888	0	05	8348	862A	LDX	C0147	
0162	862A	888	0	25	8336	863A	LDA	C0135	
0163	863A	888	0	32	0800	864A	SHR	0800	
0164	864A	888	0	25	000C	865A	LDA	RX	
0165	865A	888	0	37	0100	866A	SHL	0100	
0166	866A	888	0	60	8606	867A	STA	E0004	
0167	867A	888	0	25	8319	868A	LDA	C0118	
0168	868A	888	0	35	8842	8843	ERS	9F	8F
0169	8842	888	0	HH	HHHH	HHH0	CON	HHHHH	HHHH0
0170	8843	888	0	60	8605	869A	STA	E0003	
0171	869A	888	0	25	8324	870A	LDA	C0123	
0172	870A	888	0	35	8842	871A	ERS	9B	
0173	871A	888	0	60	8604	872A	STA	E0002	
0174	872A	888	0	06	8844	8844	CLX		
0175	8844	888	0	60	8603	873A	STA	E0001	
0176	873A	888	0	05	8331	874A	LDX	C0130	
0177	874A	888	0	25	8319	875A	LDA	C0118	
0178	875A	888	0	32	0700	876A	SHR	0700	
0179	876A	888	0	25	000C	877A	LDA	RX	
0180	877A	888	0	37	0600	878A	SHL	0600	
0181	878A	888	0	60	8611	879A	STA	E0009	
0182	879A	888	0	05	8336	880A	LDX	C0135	
0183	880A	888	0	25	8324	881A	LDA	C0123	
0184	881A	888	0	32	0700	882A	SHR	0700	
0185	882A	888	0	25	000C	883A	LDA	RX	
0186	883A	888	0	37	0600	884A	SHL	0600	
0187	884A	888	0	60	8610	8845	STA	E0008	BLST
0188	8845	888	0	25	8846	8847	LDA	9F	
0189	8846	888	0	00	8621	8602	JMP	E0019	E0000
0190	8847	888	0	88	4400	885A	TCD	R0200	
0191	885A	888	0	25	8818	886A	LDA	K1	
0192	886A	888	0	70	8848	8849	ADD		9F
0193	8848	888	0	00	0000	0001	CON	00000	00001
0194	8849	888	0	80	4401	887A	TDC	R0201	
0195	887A	888	0	25	8818	888A	LDA	K1	
0196	888A	888	0	35	8850	8851	ERS		9F
0197	8850	888	0	00	0000	HHHH	CON	00000	0HHHH
0198	8851	888	0	37	0400	889A	SHL	0400	

MOVE REGION E TO NEXT  
FREE CARD INPUT BUFFER

THEN CYCLE EMPTY BUFFER CONTROL LINK K1.



0199	889A	888	0	20	8852	000A
0200	8852	888	0	25	0000	890A
0201	890A	888	0	60	8818	8827
0202	8827	888	0	25	8853	8854
0203	8853	888	0	00	8200	8001
0204	8854	888	0	80	4000	8821
0205	8832	888	0	47	0200	891A
0206	891A	888	0	67	0001	8821
0207						
0208	8855	888	0	42	8820	892A
0209	892A	888	0	26	8856	8856
0210	8856	888	0	60	8857	8858
0211	8858	888	0	72	8859	8860
0212	8859	888	0	42	8820	8858
0213	8860	888	0	25	8817	893A
0214	893A	888	0	30	8818	894A
0215	894A	888	0	82	8862	8863
0216	8862	888	0	42	8820	8858
0217	8863	888	0	88	4400	895A
0218	895A	888	0	35	8864	8865
0219	8864	888	0	00	0000	HHHH
0220	8865	888	0	37	0400	896A
0221	896A	888	0	20	8866	000A
0222	8866	888	0	25	0000	897A
0223	897A	888	0	60	8817	898A
0224	898A	888	0	25	8867	8868
0225	8867	888	0	00	8801	8782
0226	8868	888	0	80	4400	899A
0227	899A	888	0	42	8820	800F
0228	800F	888	0	04	0000	0000
0229	8861	888	0	07	0150	801F
0230	801F	888	0	77	801F	802F
0231	802F	888	0	07	0001	803F
0232	803F	888	0	70	8857	804F
0233	804F	888	0	60	8857	805F
0234	805F	888	0	05	0000	806F
0235	806F	888	0	82	8869	8860
0236	8869	888	0	67	0002	8855
0237	8870	888	0	07	0150	807F
0238	807F	888	0	77	807F	808F
0239	808F	888	0	26	8871	8871
0240	8871	888	0	88	0000	809F
0241	809F	888	0	42	8872	810F
0242	810F	888	0	05	0000	811F
0243	811F	888	0	70	8873	8871
0244	8873	888	0	00	0001	0000
0245	8872	888	0	42	8820	8870
0246	8819	888	0	08	8874	8855
0247	8874	888	0	25	8790	812F
0248	812F	888	0	30	8875	8876

	BUF		RA
	LDA	0000	
	STA	K1	U5
U5	LDA		9F
	JMP	F0199	F0000
9	TDC	D0000	UEX
U6	HSS	0200	
	HLT	0001	UEX
G1	HBT	U1	
	CLA		
	STA	T	G2
G2	HCC		-G3
	HBT	U1	G2
-G3	LDA	K0	
	LDL	K1	
	TEQ		G4
	HBT	U1	G2
G4	TCD	R0200	
	ERS		9F
	CON	00000	0HHHH
9	SHL	0400	
	SUF		RA
	LDA	0000	
	STA	K0	
	LDA		9F
	JMP	G0019	G0000
9	TDC	R0200	
	HBT	U1	
	JMP1	0000	
8G3	IIR	0150	
	ATL		
	IIR	0001	
	ADD	T	
	STA	T	
	LDX	0000	
	TEQ		-G3
	HLT	0002	G1
STOP	IIR	0150	
	ATL		
	CLA	2F	
2	TEQ1	0000	
	HBT	1F	
	LDX	0000	
	ADD		2B
	CON	00000	10000
1	HBT	U1	STOP
MASTR	LIR1	MAST1	G1
MAST1	LDA	G0008	
	LDL		2F

U6. MOVE STATION 1  
TO 1ST STATION AREA. THEN#EXIT.

U7. SELECT STACKER 2  
BEGINNING WITH BAD COMPARISON CARD. HALT.  
X THEN#EXIT.

G. FETCH NEXT CARD SECTION

G1. RESET TIMER  
FOR OFF NORMAL

G2. TRY TO FEED A CARD  
OFF: IF OFF NORMAL GO TONG5.  
ON:

G3. CHECK BUFFERS.  
EMP: IF BUFFERS ARE EMPTY GO TONG2  
AND FEED ANOTHER CARD.  
ONE:

G4. MOVE NEXT IMAGE  
TO AREA G.

THEN CYCLE FULL BUFFER CONTROL LINK K0.  
AFTER THAT#EXIT.

G5. STEP TIMER  
STEP THE OFF NORMAL TIMER.  
150: IF TOO LONG STOP.  
THEN TRY AGAIN BY GOING TONG1.  
OK: OTHERWISE GO TONG3 AND EMPTY A BUFFER.  
G SYNCHRONIZE LOOP WITH DRUM

S. STOP ROUTINE

S1. SHUT DOWN READER  
COUNT TO 150 TO MAKE SURE ALL COMMITTED  
CARDS HAVE BEEN READ.  
THEN#EXIT.

G SYNCHRONIZE LOOP WITH DRUM

M. MASTER PROCESS CONTROL

M1. FETCH A CARD  
BY GOING TO SECTION G.

0249	8875	888	0	11	2000	0000		ZON	FIN	0	00000
0250	8876	888	0	82	8877	8878	2	TEO			3F
0251	8877	888	0	25	8791	813F		LDA	G0009		
0252	813F	888	0	30	8879	8880		LDL			2F
0253	8879	888	0	69	5800	0000		NUM	FIN	0	00000
0254	8880	888	0	82	8881	8882	2	TEO			4F
0255	8881	888	0	25	8883	8884		LDA			2F
0256	8883	888	0	99	9999	9999		CON	99999		99999
0257	8884	888	0	60	8807	8885	2	STA	NUM		WRITE
0258	8878	888	0	30	8886	8887	3	LDL			2F
0259	8886	888	0	12	3000	0000		ZON	CPY	0	00000
0260	8887	888	0	82	8888	8882	2	TEO			4F
0261	8888	888	0	25	8791	814F		LDA	G0009		
0262	814F	888	0	30	8889	8890		LDL			2F
0263	8889	888	0	37	8800	0000		NUM	CPY	0	00000
0264	8890	888	0	82	8891	8882	2	TEO	COPY		4F
0265	8882	888	0	08	8819	8885	4	LIR1	MASTR		WRITE
0266											
0267											
0268											
0269	8891	888	0	08	8892	8870	COPY	LIR1	5F		STOP
0270	8892	888	1	02	8893	8805	5	LIR2	6F		CKWR
0271	8893	888	0	25	8787	815F	6	LDA	G0005		
0272	815F	888	0	05	8789	816F		LDX	G0007		
0273	816F	888	0	32	0500	817F		SHR	0500		
0274	817F	888	0	60	8894	818F		STA	FRST		
0275	818F	888	0	65	8895	8896		STX	LST	-CP	
0276	8896	888	0	30	4201	819F	-CP	LDL	R0001		
0277	819F	888	0	25	8894	820F		LDA	FRST		
0278	820F	888	0	35	8898	8899		ERS			2F
0279	8898	888	0	00	0000	HHH0		CON	00000		0HHH0
0280	8899	888	0	82	8900	8901	2	TEO	3F		8F
0281	8901	888	0	87	8902	8903	8	TGR	9F		4F
0282	8902	888	0	G2	0200	821F	9	TRD	0200		
0283	821F	888	0	C7	8902	822F		TBT	98		
0284	822F	888	0	C7	8904	822F		TBT		*	
0285	8904	888	0	26	8905	8905		CLA			
0286	8905	888	0	82	8906	8897		TEO		&CP	
0287	8906	888	0	F6	4200	8896		TBU	R0000	-CP	
0288	8897	888	0	67	0006	8903	&CP	HLT	0006	4F	
0289	8903	888	0	G2	0205	823F	4	TRD	0205		
0290	823F	888	0	C7	8907	823F		TBT		*	
0291	8907	888	0	26	8908	8908		CLA			
0292	8908	888	0	82	8909	8911		TEO		&CPP	
0293	8909	888	0	F6	4200	8910		TBU	R0000	-CPP	
0294	8910	888	0	25	8894	824F	-CPP	LDA	FRST		
0295	824F	888	0	35	8912	8913		ERS		2F	
0296	8912	888	0	00	0000	HHH0		CON	00000		0HHH0
0297	8913	888	0	30	4343	825F	2	LDL	R0143		
0298											

M2. CHECK FOR FIN  
FIN: IF SO SET LINE NUMBER TO SENTINEL  
AND WRITE TAPE AT#W1.  
NO:

M3. CHECK FOR CPY  
CPY: IF SO JUMP TO COPY ROUTINE#C1.  
NO:

M4. WRITE LINE  
X THIS IS A CARD TO BE PROCESSED BY PASS 2 SO  
X WE WRITE IT OUT, USING ROUTINE W, AND GO  
X BACK TO#M1.  
C. COPY OLD TAPE  
C1. STOP THE READER  
ROUTINE S.  
C2. CHECK PREV WRITE  
AT #50.  
C3. SET UP FIRST, LAST  
LINE NUMBERS FOR OLD TAPE.  
C4. FIRST: CURRENT  
LESS IF FIRST IS LESS THAN CURRENT GO TO#C6.  
EQL IF FIRST EQUALS CURRENT GO TO#C8.  
GTR

C5. READ TAPE FORWARD  
OK: THEN GO BACK TO#C4.  
BAD:  
IF ERROR ON TAPE READ, HOWEVER, HALT AND  
REVERSE DIRECTION

C6. READ TAPE BACKWARD  
BAD: IF ERROR REVERSE DIRECTION AT#C5.  
OK:

C7. RECOMPARE  
LESS IF FIRST IS STILL LESS THAN CURRENT, GO TO#C6  
EQL IF THEY ARE EQUAL, REREAD FORWARD AT#C5.  
GTR IF GREATER, WE ALSO GO TO#C5 (PROBABLY A BAD  
X MACHINE ERROR)

0299	825F	888	0	82	8902	8901		TEQ	9B	8B
0300	8911	888	0	67	0006	8902	&CPP	HLT	0006	9B
0301	8900	888	0	25	8894	826F	3	LDA	FRST	
0302	826F	888	0	35	8914	8915		ERS		2F
0303	8914	888	0	00	0000	000H		CON	00000	0000H
0304	8915	888	0	37	0500	827F	2	SHL	0500	
0305	827F	888	0	70	000A	828F		ADD	RA	
0306	828F	888	0	70	8916	8917		ADD	MOV	1F
0307	8916	888	0	80	4200	8918	MOV	TDC	R0000	WRIT2
0308	8917	888	0	60	8919	829F	1	STA	WRIT1	
0309	829F	888	0	25	8920	8919		LDA		WRIT1
0310	8920	888	0	00	8801	8782		JMP	G0019	G0000
0311	8918	888	0	08	8921	8885	WRIT2	LIR1	5F	WRITE
0312										
0313	8921	888	0	25	8894	830F	5	LDA	FRST	
0314	830F	888	0	30	8895	831F		LDL	LST	
0315	831F	888	0	70	8922	832F		ADD	ONE	
0316										
0317	832F	888	0	87	8819	833F		TGR	MASTR	
0318	833F	888	0	60	8894	8923		STA	FRST	5F
0319	8923	888	0	25	8919	834F	5	LDA	WRIT1	
0320	834F	888	0	70	8924	835F		ADD	M20	
0321	835F	888	0	30	8925	8926		LDL		2F
0322	8925	888	0	80	4400	8918		TDC	R0200	WRIT2
0323	8926	888	0	82	8902	8917	2	TEQ	9B	1B
0324	8924	888	0	00	0020	0000	M20	CON	00002	00000
0325	8922	888	0	00	0000	0001	ONE	CON	00000	00001
0326	8885	888	0	42	8820	836F	WRITE	HBT	U1	
0327	836F	888	0	25	8807	837F		LDA	NUM	
0328	837F	888	0	60	8783	838F		STA	G0001	
0329	838F	888	0	31	8927	8927		CLL		
0330	8927	888	0	50	8782	839F		STL	G0000	
0331	839F	888	0	70	8922	8928		ADD	ONE	-WR
0332	8928	888	0	60	8807	8930	-WR	STA	NUM	WR4
0333	8930	888	0	25	8931	8932	WR4	LDA		1F
0334	8931	888	0	00	8801	8782		JMP	G0019	G0000
0335	8932	888	0	88	4000	840F	1	TCD	00000	
0336	840F	888	0	25	8814	841F		LDA	WR2	
0337	841F	888	0	30	8933	8934		LDL	9F	1F
0338	8933	888	0	00	8600	8581	9	JMP	B0199	B0180
0339	8934	888	0	80	4000	842F	1	TDC	00000	
0340	842F	888	0	82	8935	843F		TEQ	1F	
0341	843F	888	0	70	8936	844F		ADD	TWTW	
0342	844F	888	0	60	8814	845F		STA	WR2	
0343	845F	888	0	42	8820	846F		HBT	U1	
0344	846F	888	0	04	0000	0000		JMP1	0000	
0345	8935	888	0	25	8937	8938	1	LDA	8F	1F
0346	8937	888	0	00	8420	8401	8	JMP	B0019	B0000
0347	8938	888	0	60	8814	847F	1	STA	WR2	
0348	847F	888	0	42	8820	848F		HBT	U1	

C8. MOVE TO OUTPUT.  
MOVE A RECORD FROM THE OLD TAPE TO  
WORKING STORAGE (REGION G).

C9. THEN WRITE IT OUT  
X THE OLD TAPE IS NOW POSITIONED TO WRITE  
PROPERLY. USE SECTION W TO WRITE OUT A LINE.  
INCREMENT 'FRST' AND CHECK FOR END.  
DONEIF DONE WITH THIS COPY CARD,GO BACK TO MASTER  
X CONTROL#M1  
MORE

C10.CHECK INPUT BUFFER  
EMPTIF EXHAUSTED READ ANOTHER RECORD AT#C5.  
OK OTHERWISE GO BACK TO#C8.

W. TAPE WRITE CONTROL SECTION.  
W1. SET LINE COUNT.  
AND INCREMENT  
FIN:IF SENTINEL JUMP TO#W4.  
OK:  
W2. PLACE IN BUFFER  
THEN CHECK FOR BUFFER FULL.  
OK: IF NOT, #EXIT.  
FULL

0349 848F 888 0 25 8401 849F  
0350 849F 888 0 60 8601 850F  
0351 850F 888 1 02 8939 8805  
0352 8936 888 0 00 0020 0020  
0353 8939 888 0 C6 8402 8940  
0354 8940 888 0 H2 0300 851F  
0355 851F 888 0 C2 8941 8942  
0356 8941 888 0 42 8820 8940  
0357 8942 888 0 25 8943 852F  
0358 852F 888 0 60 8805 853F  
0359 853F 888 0 04 0000 0000  
0360 8929 888 0 08 8944 8930  
0361 8944 888 0 25 8814 854F  
0362 854F 888 0 30 8937 855F  
0363  
0364 855F 888 0 82 8945 8929  
0365 8945 888 1 02 8946 8805  
0366 8946 888 0 08 8947 8870  
0367 8947 888 0 C6 8402 8948  
0368 8948 888 0 H2 0300 856F  
0369 856F 888 0 C2 8948 857F  
0370 857F 888 0 F2 0200 8804  
0371 8804 888 0 F2 0300 858F  
0372 858F 888 0 G2 0400 859F  
0373 859F 888 0 F6 8000 8000  
0374 8803 888 1 00 0000 0000  
0375 8943 888 0 C7 8949 860F  
0376 860F 888 0 42 8820 8943  
0377 8949 888 0 26 8950 8950  
0378 8950 888 0 82 8951 861F  
0379 861F 888 0 0G 0000 862F  
0380 862F 888 0 20 8952 8953  
0381 8952 888 0 08 0000 8954  
0382 8953 888 0 60 8955 863F  
0383 863F 888 0 08 8955 8870  
0384 8954 888 0 67 0005 8803  
0385 8951 888 0 25 8803 864F  
0386 864F 888 0 60 8805 8803  
- 0387

TWTW  
5  
1

7

&WR

5

5

5

PASS2

WROF

WRON

1

2

CKW1

3

LDA 80000  
STA 80200  
LIR2 5F  
CON 00002  
TBL 80001  
TWR 0300  
TST  
HBT U1  
LDA WRON  
STA CKWR  
JMP1 0000  
LIR1  
LDA WR2  
LDL 88  
TEQ  
LIR2 5F  
LIR1 5F  
TBL 80001  
TWR 0300  
TST 58  
TRW 0200  
TRW 0300  
TRD 0400  
TBU 8000  
JMP2 0000  
TBT 1F  
HBT U1  
CLA  
TEQ 3F  
IIR1 0000  
BUF  
LIR1 0000  
STA CKW2  
LIR1 CKW2  
HLT 0005  
LDA WROF  
STA CKWR  
END INIT

CKWR  
00020  
1F

7F  
1B

WR4

&WR  
CKWR  
STOP  
5F

PASS2

8000

WRON

2F  
CKW1

STOP  
WROF

WROF

W3. CHECK PREV WRITE

AT W50.  
LOAD THE BUFFER, WRITE, AND SET THE  
CHECKING SWITCH ON.  
THEN#EXIT.

W4. WRITE SENTINEL.

CHECK FOR END OF TAPE RECORD.  
NO: IF NOT, RETURN TO W4, WRITING SENTINELS UNTIL  
X A TAPE RECORD IS DUMPED OUT.

YES:

W5. CLEAN UP.

CHECK THE WRITE. USE W50.

WRITE ANOTHER SENTINEL BLOCK.

W6. END.

REWIND TAPES, READ#PASS2 AND EXECUTE IT.

W50. PREVIOUS WRITE...

SWITCH TESTS EXISTENCE OF PREVIOUS WRITE.

NONEIF NONE#EXIT.

WRIT

W51. WAIT READY.

WHEN TAPE IS FINISHED CHECK FOR ERRORS.

NONEIF OK SET SWITCH OFF AND#EXIT.

ERR IF ERROR STOP THE READER (SECTION S).

HALT, AND THEN#EXIT.

IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

***Remington Rand Univac***  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.



IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

**Remington Rand Univac**  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.

8622	888	0	00	8661	8642
8642	888	0	00	8681	8662
8662	888	0	00	8701	8682
8682	888	0	00	8721	8702
8702	888	0	00	8741	8722
8722	888	0	00	8641	8622
8742	888	0	30	8014	8802
8743	888	0	30	8026	8802
8744	888	0	30	8038	8802
8745	888	0	30	8050	8802
8746	888	0	30	8062	8802
8747	888	0	30	8074	8802
8748	888	0	30	8086	8802
8749	888	0	30	8098	8802
8750	888	0	30	8019	8802
8751	888	0	30	8031	8802
8752	888	0	30	8043	8802
8753	888	0	30	8055	8802
8754	888	0	30	8067	8802
8755	888	0	30	8079	8802
8756	888	0	30	8091	8802
8757	888	0	30	8112	8802
8762	888	0	25	8319	000C
8763	888	0	25	8331	000C
8764	888	0	25	8343	000C
8765	888	0	25	8355	000C
8766	888	0	25	8367	000C
8767	888	0	25	8379	000C
8768	888	0	25	8391	000C
8769	888	0	25	8207	000C
8770	888	0	25	8324	000C
8771	888	0	25	8336	000C
8772	888	0	25	8348	000C

U0000  
U0020  
U0040  
U0060  
V0000  
V0020  
I0001  
I0002  
I0003  
I0004  
I0005  
I0006  
I0007  
I0008  
I0009  
I0010  
I0011  
I0012  
I0013  
I0014  
I0015  
I0016  
J0001  
J0002  
J0003  
J0004  
J0005  
J0006  
J0007  
J0008  
J0009  
J0010  
J0011

NEW1	00001
EQU	8999
BLR	4200
BLR	4000
COR	0200
COR	0200
COR	0201
COR	0020
COR	0080
COR	0040
COR	0020
COR	0020
COR	0020
HHH	
JMP	U0039
JMP	U0059
JMP	U0079
JMP	V0019
JMP	V0039
JMP	U0019
LDL	F0013
LDL	F0025
LDL	F0037
LDL	F0049
LDL	F0061
LDL	F0073
LDL	F0085
LDL	F0097
LDL	F0018
LDL	F0030
LDL	F0042
LDL	F0054
LDL	F0066
LDL	F0078
LDL	F0090
LDL	F0111
LDA	C0118
LDA	C0130
LDA	C0142
LDA	C0154
LDA	C0166
LDA	C0178
LDA	C0190
LDA	C0006
LDA	C0123
LDA	C0135
LDA	C0147

00000  
4419  
4199  
  
U0020  
U0040  
U0060  
V0000  
V0020  
U0000  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
TB1R  
RX  
RX  
RX  
RX  
RX  
RX  
RX  
RX  
RX  
RX

## 2ND STATION UNLOAD CONTROL

0065	8773	888	0	25	8360	000C	J0012	LDA	C0159	RX
0066	8774	888	0	25	8372	000C	J0013	LDA	C0171	RX
0067	8775	888	0	25	8384	000C	J0014	LDA	C0183	RX
0068	8776	888	0	25	8396	000C	J0015	LDA	C0195	RX
0069	8777	888	0	25	8212	000C	J0016	LDA	C0011	RX

0070	B999	888	0	25	B803	B00A
0071						
0072	B00A	888	0	67	B804	B01A
0073	B01A	888	0	60	B805	B02A
0074	B02A	888	0	F2	0300	B03A
0075	B03A	888	0	26	B806	B806
0076	B806	888	0	60	B807	B04A
0077	B04A	888	0	60	B808	B05A
0078	B05A	888	0	25	B809	B810
0079	B809	888	1	00	0050	0000
0080	B810	888	0	60	B811	B06A
0081	B06A	888	0	25	B812	B813
0082	B812	888	0	00	B420	B401
0083	B813	888	0	60	B814	B07A
0084	B07A	888	0	25	B815	B816
0085	B815	888	1	00	0000	0010
0086	B816	888	0	60	4201	B08A
0087	B08A	888	0	25	B622	B09A
0088	B09A	888	0	60	B817	B10A
0089	B10A	888	0	60	B818	B819

INIT

LDA #ROF

HLT PASS2

STA CKWR

TRW 0300

CLA

STA NUM

STA SSCT

LDA

CON1 00005

STA SSW

LDA

JMP B0019

STA WR2

LDA

CON1 00000

STA R0001

LDA U0000

STA K0

STA K1

9F

00000

2F

B0000

9F

00010

MASTR

I. INITIALIZE.

II. STOP.

12. SET STARTING VALUES

13. THEN GO

0090	8820	888	0	60	8821	811A	U1	STA	UEX		U. UNLOAD SECTION
0091	811A	888	0	96	4001	812A		HBU	D0001		U1. UNLOAD BUFFER
0092	812A	888	0	25	8822	8823		LDA		9F	
0093	8822	888	0	00	8400	8201		JMP	C0199	C0000	
0094	8823	888	0	80	4000	8824	9	TDC	D0000	U2	
0095	8824	888	0	30	8825	8826	U2	LDL		9F	U2. CHECK 2ND
0096	8825	888	0	HH	HHHH	HHHH		CON	HHHHH	HHHHH	
0097	8826	888	0	25	8207	813A	9	LDA	C0006		
0098	813A	888	0	82	8827	8828		TEQ	U5	U3	
0099	8828	888	0	05	8829	814A	U3	LDX	8F		U3. COMPARE 2ND STATION
0100	814A	888	1	08	0016	8830		LIR3	0016	9F	
0101	8830	888	1	04	8741	8741	9	JMP3	I0000		
0102	8802	888	1	04	8761	8761	TB1R	JMP3	J0000		
0103	8829	888	0	82	8831	8832	8	TEQ		U6	
0104	8831	888	1	06	9999	815A		IIR3	9999		
0105	815A	888	0	31	8833	8833		CLL			
0106	8833	888	0	82	8834	8830	U4	TEQ	U4	9B	U4. CHECK FOR 600 CARDS
0107	8834	888	0	07	0600	816A		IIR	0600		
0108	816A	888	0	77	816A	817A		ATL			
0109	817A	888	0	07	0001	818A		IIR	0001		
0110	818A	888	0	70	8808	819A		ADD	SSCT		
0111	819A	888	0	60	8808	820A		STA	SSCT		
0112	820A	888	0	82	8835	8836		TEQ		2F	
0113	8835	888	0	26	8837	8837		CLA			
0114	8837	888	0	60	8808	821A		STA	SSCT		
0115	821A	888	0	75	8811	822A		SUB	SSW		
0116	822A	888	0	60	8811	8838		STA	SSW	3F	
0117	8836	888	0	25	8811	8838	2	LDA	SSW	3F	
0118	8838	888	0	70	8839	000A	3	ADD		RA	
0119	8839	888	0	47	0050	4999		HSS	0050	4999	WATCH OUT FOR UNDIGIT GARBLE
0120	4999	888	0	25	8207	823A	4999	LDA	C0006		U5. FILL INTERNAL BUFFER
0121	823A	888	0	60	8621	824A		STA	E0019		
0122	824A	888	0	25	8212	825A		LDA	C0011		
0123	825A	888	0	60	8620	826A		STA	E0018		
0124	826A	888	0	25	8391	827A		LDA	C0190		
0125	827A	888	0	60	8619	828A		STA	E0017		
0126	828A	888	0	25	8396	829A		LDA	C0195		
0127	829A	888	0	60	8618	830A		STA	E0016		
0128	830A	888	0	25	8379	831A		LDA	C0178		
0129	831A	888	0	60	8617	832A		STA	E0015		
0130	832A	888	0	25	8384	833A		LDA	C0183		
0131	833A	888	0	60	8616	834A		STA	E0014		
0132	834A	888	0	25	8367	835A		LDA	C0166		
0133	835A	888	0	60	8615	836A		STA	E0013		
0134	836A	888	0	25	8372	837A		LDA	C0171		
0135	837A	888	0	60	8614	838A		STA	E0012		
0136	838A	888	0	25	8355	839A		LDA	C0154		
0137	839A	888	0	35	8840	8841		ERS	9F	8F	
0138	8840	888	0	0H	HHHH	HHHH	9	CON	0HHHH	HHHHH	



0139	8841	888	0	60	8613	840A
0140	840A	888	0	25	8360	841A
0141	841A	888	0	35	8840	842A
0142	842A	888	0	60	8612	843A
0143	843A	888	0	05	8355	844A
0144	844A	888	0	25	8343	845A
0145	845A	888	0	32	0900	846A
0146	846A	888	0	25	000C	847A
0147	847A	888	0	37	0100	848A
0148	848A	888	0	60	8609	849A
0149	849A	888	0	05	8360	850A
0150	850A	888	0	25	8348	851A
0151	851A	888	0	32	0900	852A
0152	852A	888	0	25	000C	853A
0153	853A	888	0	37	0100	854A
0154	854A	888	0	60	8608	855A
0155	855A	888	0	05	8343	856A
0156	856A	888	0	25	8331	857A
0157	857A	888	0	32	0800	858A
0158	858A	888	0	25	000C	859A
0159	859A	888	0	37	0100	860A
0160	860A	888	0	60	8607	861A
0161	861A	888	0	05	8348	862A
0162	862A	888	0	25	8336	863A
0163	863A	888	0	32	0800	864A
0164	864A	888	0	25	000C	865A
0165	865A	888	0	37	0100	866A
0166	866A	888	0	60	8606	867A
0167	867A	888	0	25	8319	868A
0168	868A	888	0	35	8842	8843
0169	8842	888	0	HH	HHHH	HHH0
0170	8843	888	0	60	8605	869A
0171	869A	888	0	25	8324	870A
0172	870A	888	0	35	8842	871A
0173	871A	888	0	60	8604	872A
0174	872A	888	0	06	8844	8844
0175	8844	888	0	60	8603	873A
0176	873A	888	0	05	8331	874A
0177	874A	888	0	25	8319	875A
0178	875A	888	0	32	0700	876A
0179	876A	888	0	25	000C	877A
0180	877A	888	0	37	0600	878A
0181	878A	888	0	60	8611	879A
0182	879A	888	0	05	8336	880A
0183	880A	888	0	25	8324	881A
0184	881A	888	0	32	0700	882A
0185	882A	888	0	25	000C	883A
0186	883A	888	0	37	0600	884A
0187	884A	888	0	60	8610	8845
0188	8845	888	0	25	8846	8847

9  
8

BLST

STA	E0011
LDA	C0159
ERS	9B
STA	E0010
LDX	C0154
LDA	C0142
SHR	0900
LDA	RX
SHL	0100
STA	E0007
LDX	C0159
LDA	C0147
SHR	0900
LDA	RX
SHL	0100
STA	E0006
LDX	C0142
LDA	C0130
SHR	0800
LDA	RX
SHL	0100
STA	E0005
LDX	C0147
LDA	C0135
SHR	0800
LDA	RX
SHL	0100
STA	E0004
LDA	C0118
ERS	9F
CON	HHHHH
STA	E0003
LDA	C0123
ERS	9B
STA	E0002
CLX	
STA	E0001
LDX	C0130
LDA	C0118
SHR	0700
LDA	RX
SHL	0600
STA	E0009
LDX	C0135
LDA	C0123
SHR	0700
LDA	RX
SHL	0600
STA	E0008
LDA	

8F  
HHH0

BLST  
9F

0189	8846	888	0	00	8621	8602
0190	8847	888	0	88	4400	885A
0191	885A	888	0	25	8818	886A
0192	886A	888	0	70	8848	8849
0193	8848	888	0	00	0000	0001
0194	8849	888	0	80	4401	887A
0195	887A	888	0	25	8818	888A
0196	888A	888	0	35	8850	8851
0197	8850	888	0	00	0000	HHHH
0198	8851	888	0	37	0400	889A
0199	889A	888	0	20	8852	000A
0200	8852	888	0	25	0000	890A
0201	890A	888	0	60	8818	8827
0202	8827	888	0	25	8853	8854
0203	8853	888	0	00	8200	8001
0204	8854	888	0	80	4000	8821
0205	8832	888	0	47	0200	891A
0206	891A	888	0	67	0001	8821

9	JMP	E0019	E0000
	TCD	R0200	
	LDA	K1	
	ADD		9F
	CON	00000	00001
9	TDC	R0201	
	LDA	K1	
	ERS		9F
	CON	00000	0HHHH
9	SHL	0400	
	BUF		RA
	LDA	0000	
	STA	K1	U5
U5	LDA		9F
	JMP	F0199	F0000
9	TDC	00000	UEX
U6	HSS	0200	
	HLT	0001	UEX

U6. MOVE STATION 1

U7. SELECT STACKER 2

0208	8855	888	0	42	8820	892A
0209	892A	888	0	26	8856	8856
0210	8856	888	0	60	8857	8858
0211	8858	888	0	72	8859	8860
0212	8859	888	0	42	8820	8858
0213	8860	888	0	25	8817	893A
0214	893A	888	0	30	8818	894A
0215	894A	888	0	82	8862	8863
0216	8862	888	0	42	8820	8858
0217	8863	888	0	88	4400	895A
0218	895A	888	0	35	8864	8865
0219	8864	888	0	00	0000	HHHH
0220	8865	888	0	37	0400	896A
0221	896A	888	0	20	8866	000A
0222	8866	888	0	25	0000	897A
0223	897A	888	0	60	8817	898A
0224	898A	888	0	25	8867	8868
0225	8867	888	0	00	8801	8782
0226	8868	888	0	80	4400	899A
0227	899A	888	0	42	8820	800F
0228	800F	888	0	04	0000	0000
0229	8861	888	0	07	0150	801F
0230	801F	888	0	77	801F	802F
0231	802F	888	0	07	0001	803F
0232	803F	888	0	70	8857	804F
0233	804F	888	0	60	8857	805F
0234	805F	888	0	05	0000	806F
0235	806F	888	0	82	8869	8860
0236	8869	888	0	67	0002	8855

G1	HBT	U1	
	CLA		
	STA	T	G2
G2	HCC		-G3
	HBT	U1	G2
-G3	LDA	K0	
	LCL	K1	
	TEQ		G4
	HBT	U1	G2
G4	TCD	R0200	
	ERS		9F
	CON	00000	0HHHH
9	SHL	0400	
	BUF		RA
	LDA	0000	
	STA	K0	
	LDA		9F
	JMP	G0019	G0000
9	TDC	R0200	
	HBT	U1	
	JMP1	0000	
8G3	IIR	0150	
	ATL		
	IIR	0001	
	ADD	T	
	STA	T	
	LDX	0000	
	TEQ		-G3
	HLT	0002	G1

G. FETCH NEXT CARD SECTION  
G1. RESET TIMER

G2. TRY TO FEED A CARD

G3. CHECK BUFFERS.

G4. MOVE NEXT IMAGE

G5. STEP TIMER

SYNCHRONIZE LOOP WITH DRUM

0237	8870	888	0	07	0150	807F
0238	807F	888	0	77	807F	808F
0239	808F	888	0	26	8871	8871
0240	8871	888	0	88	0000	809F
0241	809F	888	0	42	8872	810F
0242	810F	888	0	05	0000	811F
0243	811F	888	0	70	8873	8871
0244	8873	888	0	00	0001	0000
0245	8872	888	0	42	8820	8870

STOP

2

1

IIR	0150
ATL	
CLA	2F
TEQ1	0000
HBT	1F
LDX	0000
ADD	
CON	00000
HBT	U1

28  
10000  
STOP

S. STOP ROUTINE  
S1. SHUT DOWN READER

SYNCHRONIZE LOOP WITH DRUM

0246	8819	888	0	08	8874	8855	MASTR	LIR1	MAST1	G1	M. MASTER PROCESS CONTROL
0247	8874	888	0	25	8790	812F	MAST1	LDA	G0008		M1. FETCH A CARD
0248	812F	888	0	30	8875	8876		LDL		2F	
0249	8875	888	0	11	2000	0000		ZON	FIN 0	00000	
0250	8876	888	0	82	8877	8878	2	TEQ		3F	M2. CHECK FOR FIN
0251	8877	888	0	25	8791	813F		LDA	G0009		
0252	813F	888	0	30	8879	8880		LDL		2F	
0253	8879	888	0	69	5800	0000		NUM	FIN 0	00000	
0254	8880	888	0	82	8881	8882	2	TEQ		4F	
0255	8881	888	0	25	8883	8884		LDA		2F	
0256	8883	888	0	99	9999	9999		CON	99999	99999	
0257	8884	888	0	60	8807	8885	2	STA	NUM	WRITE	
0258	8878	888	0	30	8886	8887	3	LDL		2F	M3. CHECK FOR CPY
0259	8886	888	0	12	3000	0000		ZON	CPY 0	00000	
0260	8887	888	0	82	8888	8882	2	TEQ		4F	
0261	8888	888	0	25	8791	814F		LDA	G0009		
0262	814F	888	0	30	8889	8890		LDL		2F	
0263	8889	888	0	37	8800	0000		NUM	CPY 0	00000	
0264	8890	888	0	82	8891	8882	2	TEQ	COPY	4F	
0265	8882	888	0	08	8819	8885	4	LIR1	MASTR	WRITE	M4. WRITE LINE



0269 8891 888 0 08 8892 8870  
0270 8892 888 1 02 8893 8805  
0271 8893 888 0 25 8787 815F  
0272 815F 888 0 05 8789 816F  
0273 816F 888 0 32 0500 817F  
0274 817F 888 0 60 8894 818F  
0275 818F 888 0 65 8895 8896  
0276 8896 888 0 30 4201 819F  
0277 819F 888 0 25 8894 820F  
0278 820F 888 0 35 8898 8899  
0279 8898 888 0 00 0000 HHH0  
0280 8899 888 0 82 8900 8901  
0281 8901 888 0 87 8902 8903  
0282 8902 888 0 62 0200 821F  
0283 821F 888 0 C7 8902 822F  
0284 822F 888 0 C7 8904 822F  
0285 8904 888 0 26 8905 8905  
0286 8905 888 0 82 8906 8897  
0287 8906 888 0 F6 4200 8896  
- 0288 8897 888 0 67 0006 8903  
0289 8903 888 0 62 0205 823F  
0290 823F 888 0 C7 8907 823F  
0291 8907 888 0 26 8908 8908  
0292 8908 888 0 82 8909 8911  
0293 8909 888 0 F6 4200 8910  
0294 8910 888 0 25 8894 824F  
0295 824F 888 0 35 8912 8913  
0296 8912 888 0 00 0000 HHH0  
0297 8913 888 0 30 4343 825F  
0299 825F 888 0 82 8902 8901  
0300 8911 888 0 67 0006 8902  
0301 8900 888 0 25 8894 826F  
0302 826F 888 0 35 8914 8915  
0303 8914 888 0 00 0000 000H  
0304 8915 888 0 37 0500 827F  
0305 827F 888 0 70 000A 828F  
0306 828F 888 0 70 8916 8917  
0307 8916 888 0 80 4200 8918  
0308 8917 888 0 60 8919 829F  
0309 829F 888 0 25 8920 8919  
0310 8920 888 0 00 8801 8782  
0311 8918 888 0 08 8921 8885  
0313 8921 888 0 25 8894 830F  
0314 830F 888 0 30 8895 831F  
0315 831F 888 0 70 8922 832F  
0317 832F 888 0 87 8819 833F  
0318 833F 888 0 60 8894 8923  
0319 8923 888 0 25 8919 834F  
0320 834F 888 0 70 8924 835F

COPY  
5  
6

-CP

2  
8  
9

8CP  
4

-CPP

2

8CPP  
3

2

MOV  
1

WRIT2  
5

5

LIR1 5F  
LIR2 6F  
LDA G0005  
LDX G0007  
SHR 0500  
STA FRST  
STX LST  
LDL R0001  
LDA FRST  
ERS  
CON 00000  
TEQ 3F  
TGR 9F  
TRD 0200  
TBT 9B  
TBT  
CLA  
TEQ  
TBU R0000  
HLT 0006  
TRD 0205  
TBT  
CLA  
TEQ  
TBU R0000  
LDA FRST  
ERS  
CON 00000  
LDL R0143  
TEQ 9B  
HLT 0006  
LDA FRST  
ERS  
CON 00000  
SHL 0500  
ADD RA  
ADD MOV  
TDC R0000  
STA WRIT1  
LDA  
JMP G0019  
LIR1 5F  
LDA FRST  
LDL LST  
ADD ONE  
TGR MASTR  
STA FRST  
LDA WRIT1  
ADD M20

STOP  
CK#R

-CP

2F  
0HHH0  
8F  
4F

8CP  
-CP  
4F

8CPP  
-CPP

2F  
0HHH0

8B  
9B

2F  
0000H

1F  
WRIT2

WRIT1  
G0000  
WRITE

5F

C. COPY OLD TAPE  
C1. STOP THE READER  
  
C2. CHECK PREV WRITE  
  
C3. SET UP FIRST, LAST  
  
C4. FIRST: CURRENT

C5. READ TAPE FORWARD

C6. READ TAPE BACKWARD

C7. RECOMPARE

C8. MOVE TO OUTPUT.

C9. THEN WRITE IT OUT

C10. CHECK INPUT BUFFER

0321	835F	888	0	30	8925	8926
0322	8925	888	0	80	4400	8918
0323	8926	888	0	82	8902	8917
0324	8924	888	0	00	0020	0000
0325	8922	888	0	00	0000	0001

2  
M20  
ONE

LDL	
TDC	R0200
TEO	98
CON	00002
CON	00000

2F
WRIT2
18
00000
00001

0326	B885	B88	0	42	B820	B36F
0327	B36F	B88	0	25	B807	B37F
0328	B37F	B88	0	60	B783	B38F
0329	B38F	B88	0	31	B927	B927
0330	B927	B88	0	50	B782	B39F
0331	B39F	B88	0	70	B922	B928
0332	B928	B88	0	60	B807	B930
0333	B930	B88	0	25	B931	B932
0334	B931	B88	0	00	B801	B782
0335	B932	B88	0	88	4000	B40F
0336	B40F	B88	0	25	B814	B41F
0337	B41F	B88	0	30	B933	B934
0338	B933	B88	0	00	B600	B581
0339	B934	B88	0	80	4000	B42F
0340	B42F	B88	0	82	B935	B43F
0341	B43F	B88	0	70	B936	B44F
0342	B44F	B88	0	60	B814	B45F
0343	B45F	B88	0	42	B820	B46F
0344	B46F	B88	0	04	0000	0000
0345	B935	B88	0	25	B937	B938
0346	B937	B88	0	00	B420	B401
0347	B938	B88	0	60	B814	B47F
0348	B47F	B88	0	42	B820	B48F
0349	B48F	B88	0	25	B401	B49F
0350	B49F	B88	0	60	B601	B50F
0351	B50F	B88	1	02	B939	B805
0352	B936	B88	0	00	0020	0020
0353	B939	B88	0	C6	B402	B940
0354	B940	B88	0	H2	0300	B51F
0355	B51F	B88	0	C2	B941	B942
0356	B941	B88	0	42	B820	B940
0357	B942	B88	0	25	B943	B52F
0358	B52F	B88	0	60	B805	B53F
0359	B53F	B88	0	04	0000	0000
0360	B929	B88	0	08	B944	B930
0361	B944	B88	0	25	B814	B54F
0362	B54F	B88	0	30	B937	B55F
0364	B55F	B88	0	82	B945	B929
0365	B945	B88	1	02	B946	B805
0366	B946	B88	0	08	B947	B870
0367	B947	B88	0	C6	B402	B948
0368	B948	B88	0	H2	0300	B56F
0369	B56F	B88	0	C2	B948	B57F
0370	B57F	B88	0	F2	0200	B804
0371	B804	B88	0	F2	0300	B58F
0372	B58F	B88	0	G2	0400	B59F
0373	B59F	B88	0	F6	B000	B000
0374	B803	B88	1	00	0000	0000
0375	B943	B88	0	C7	B949	B60F

WRITE

-WR  
WR4

1

9

1

1

8

1

TWTW

5

1

7

&WR

5

5

5

PASS2

WROF

WRON

HBT	U1
LDA	NUM
STA	G0001
CLL	
STL	G0000
ADD	ONE
STA	NUM
LDA	
JMP	G0019
TCO	D0000
LDA	WR2
LDL	9F
JMP	B0199
TDC	D0000
TEQ	1F
ADD	TWTW
STA	WR2
HBT	U1
JMP1	0000
LDA	8F
JMP	B0019
STA	WR2
HBT	U1
LDA	B0000
STA	B0200
LIR2	5F
CON	00002
TBL	B0001
TWR	0300
TST	
HBT	U1
LDA	WRON
STA	CKWR
JMP1	0000
LIR1	
LDA	WR2
LDL	88
TEQ	
LIR2	5F
LIR1	5F
TBL	B0001
TWR	0300
TST	58
TRW	0200
TRW	0300
TRD	0400
TBU	B000
JMP2	0000
TBT	1F

W. TAPE WRITE CONTROL SECTION.  
W1. SET LINE COUNT.

W2. PLACE IN BUFFER

W3. CHECK PREV WRITE

W4. WRITE SENTINEL.

W5. CLEAN UP.

W6. END.

W50. PREVIOUS WRITE...

-WR  
WR4  
1F  
G0000

1F  
B0180

1F  
B0000

CKWR  
00020  
1F

7F  
18

WR4

&WR  
CKWR  
STOP  
5F

PASS2

B000

0376 860F 888 0 42 8820 8943  
0377 8949 888 0 26 8950 8950  
0378 8950 888 0 82 8951 861F  
0379 861F 888 0 06 0000 862F  
0380 862F 888 0 20 8952 8953  
0381 8952 888 0 08 0000 8954  
0382 8953 888 0 60 8955 863F  
0383 863F 888 0 08 8955 8870  
0384 8954 888 0 67 0005 8803  
0385 8951 888 0 25 8803 864F  
0386 864F 888 0 60 8805 8803  
- 0387

1 HBT U1 WRON  
CLA  
TEQ 3F  
IIR1 0000  
BUF  
LIR1 0000 2F CKW1  
2 STA CKW2  
LIR1 CKW2 STOP  
CKW1 HLT 0005 WROF  
3 LDA WROF  
STA CKWR WROF  
END INIT

W51.WAIT READY.

IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

**Remington Rand Univac**  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.



\* 1. GADAAD ASSEMBLER PASS 1.  
\* TABLE OF CONTENTS  
\* C. COPY ROUTINE  
\* G. GET NEXT CARD IMAGE ROUTINE  
\* I. INITIALIZE ROUTINE  
\* M. MASTER CONTROL ROUTINE  
\* U. CARD BUFFER UNLOAD CO-ROUTINE  
\* W. TAPE WRITE ROUTINE  
\* THIS PASS READS CARDS ONTO TAPE, UPDATING  
\* A PREVIOUS TAPE.  
\* THE SHOW BEGINS AT ROUTINE I.  
\* ERROR STOPS  
\* M MEANING  
\* 1 CARD READ COMPARISON ERROR  
\* 2 HSR OFF NORMAL  
\* 5 TAPE WRITE ERROR  
\* 6 TAPE READ ERROR  
\*

```

* 1. INITIALIZE.
* 11. STOP.
*    HALT; IF M RESTART GO TO PAS2 (W6).
* 12. SET STARTING VALUES
*    SET LINE COUNT TO 0
*    SET STACKER SELECT COUNT TO 0
*    SET STACKER SELECT TO POCKET 0
*    RESET OUTPUT BUFFER
*    SET CURRENT TAPE INPUT LINE COUNT TO -10
*    CLEAR CARD INPUT BUFFERS
* 13. THEN GO
*    TO MASTER CONTROL M1.

```

```

      (---IN---)
      :
      :
0091  :
-----:
: U1. UNLOAD BUFFER :
-----:
      :
      :
0095  :
-----:
( U2. CHECK 2ND      ) EMPT.....)0
(-----:
      :
      FULL :
      :
0099  :
-----:
( U3. COMPARE 2ND STATION ) ERR:.....)0
(-----:
      :
      OK: :
      :
0107  :
-----:
: U4. CHECK FOR 600 CARDS :
-----:
      :
      :
      O(.....(0
0120  :
-----:
: U5. FILL INTERNAL BUFFER:
-----:
      :
      :
      O(.....(0
0202  :
-----:
: U6. MOVE STATION 1 : ..... EXIT
-----:
      :
0205  :
-----:
: U7. SELECT STACKER 2 : ..... EXIT
-----:

```

```

* U. UNLOAD SECTION
* U1. UNLOAD BUFFER
*   FILL 2ND STATION AREA
* U2. CHECK 2ND
*   STATION EMPTY.
*   IF EMPTY, GO TO U3.
* U3. COMPARE 2ND STATION
*   WITH PREVIOUS 1ST STATION FOR CHECK.
*   GO TO U6 IF COMPARISON FAILS.
* U4. CHECK FOR 600 CARDS
*   IF SO SWAP CARD POCKETS 0 AND 1
* U5. FILL INTERNAL BUFFER
*   EDIT 2ND STATION TO E REGION
*   SEE QADAAD PASS 2, SECTION E FOR OUTPUT
*   FORMAT
*   MOVE REGION E TO NEXT
*   FREE CARD INPUT BUFFER
*   THEN CYCLE EMPTY BUFFER CONTROL LINK K1.
* U6. MOVE STATION 1
*   TO 1ST STATION AREA. THEN EXIT.
* U7. SELECT STACKER 2
*   BEGINNING WITH BAD COMPARISON CARD. HALT.
*   THEN EXIT.

```

```
* G.  FETCH NEXT CARD SECTION
* 
* G1.  RESET TIMER
*      FOR OFF NORMAL
* 
* G2.  TRY TO FEED A CARD
*      IF OFF NORMAL GO TO G5.
* 
* G3.  CHECK BUFFERS.
*      IF BUFFERS ARE EMPTY GO TO G2
*      AND FEED ANOTHER CARD.
* 
* G4.  MOVE NEXT IMAGE
*      TO AREA G.
*      THEN CYCLE FULL BUFFER CONTROL LINK KO.
*      AFTER THAT EXIT.
* 
* G5.  STEP TIMER
*      STEP THE OFF NORMAL TIMER.
*      IF TOO LONG STOP.
*      THEN TRY AGAIN BY GOING TO G1.
*      OTHERWISE GO TO G3 AND EMPTY A BUFFER.
```

(---[N---])

:

:

:

0238

S1. SHUT DOWN READER

EXIT

S. STOP ROUTINE  
S1. SHUT DOWN READER  
COUNT TO 150 TO MAKE SURE ALL COMMITTED  
CARDS HAVE BEEN READ.  
THEN EXIT.

```
* M. MASTER PROCESS CONTROL  
*  
* M1. FETCH A CARD  
* BY GOING TO SECTION G.  
*  
* M2. CHECK FOR FIN  
* IF SO SET LINE NUMBER TO SENTINEL  
* AND WRITE TAPE AT W1.  
*  
* M3. CHECK FOR CPY  
* IF SO JUMP TO COPY ROUTINE C1.  
*  
* M4. WRITE LINE  
* THIS IS A CARD TO BE PROCESSED BY PASS 2 SO  
* WE WRITE IT OUT, USING ROUTINE W, AND GO  
* BACK TO M1.
```

## MORE

DONE.....MI

```

C. COPY OLD TAPE
C1. STOP THE READER
ROUTINE S.
C2. CHECK PREV WRITE
AT #50.
C3. SET UP FIRST, LAST
LINE NUMBERS FOR OLD TAPE.
C4. FIRST; CURRENT
IF FIRST IS LESS THAN CURRENT GO TO C6.
IF FIRST EQUALS CURRENT GO TO C8.
C5. READ TAPE FORWARD
THEN GO BACK TO C4.
IF ERROR ON TAPE READ, HOWEVER, HALT AND
REVERSE DIRECTION
C6. READ TAPE BACKWARD
IF ERROR REVERSE DIRECTION AT C5.
C7. RECOMPARE
IF FIRST IS STILL LESS THAN CURRENT, GO TO C6
IF THEY ARE EQUAL, REREAD FORWARD AT C5.
IF GREATER, WE ALSO GO TO C5 (PROBABLY A BAD
MACHINE ERROR)
C8. MOVE TO OUTPUT.
MOVE A RECORD FROM THE OLD TAPE TO
WORKING STORAGE (REGION G).
C9. THEN WRITE IT OUT
THE OLD TAPE IS NOW POSITIONED TO WRITE
PROPERLY. USE SECTION W TO WRITE OUT A LINE.
INCREMENT 'FRST' AND CHECK FOR END.
IF DONE WITH THIS COPY CARD, GO BACK TO MASTER
CONTROL M1
C10. CHECK INPUT BUFFER
IF EXHAUSTED READ ANOTHER RECORD AT C5.
OTHERWISE GO BACK TO C8.

```

0318

(-----) EMPT.....)0  
( C10.CHECK INPUT BUFFER )  
(-----) OK .....)0



```

(---IN---)
|
0327 |
(-----)
| W1. SET LINE COUNT. ) FIN:.....)0
(-----)
| OK: |
|
0331 |
(-----)
| W2. PLACE IN BUFFER ) OK: ..... EXIT
(-----)
| FULL |
|
0351 |
(-----)
| W3. CHECK PREV WRITE : ..... EXIT
(-----)
|
| 0( ..... )0
0360 |
(-----)
| W4. WRITE SENTINEL. ) NO: .....)0
(-----)
| YES: |
|
0365 |
(-----)
| W5. CLEAN UP. |
(-----)
|
|
0371 |
(-----)
| W6. END. : .....PASS2
(-----)
|
|
0374 |
(-----)
| W50. PREVIOUS WRITE... ) NONE..... EXIT
(-----)
| WRIT |
|
0378 |
(-----)
| W51. WAIT READY. ) NONE..... EXIT
(-----)
| ERR ..... EXIT
(-----)

```

```

* W. TAPE WRITE CONTROL SECTION.
* W1. SET LINE COUNT.
* AND INCREMENT
* IF SENTINEL JUMP TO W4.
* W2. PLACE IN BUFFER
* THEN CHECK FOR BUFFER FULL.
* IF NOT, EXIT.
* W3. CHECK PREV WRITE
* AT W50.
* LOAD THE BUFFER, WRITE, AND SET THE
* CHECKING SWITCH ON.
* THEN EXIT.
* W4. WRITE SENTINEL.
* CHECK FOR END OF TAPE RECORD.
* IF NOT, RETURN TO W4, WRITING SENTINELS UNTIL
* A TAPE RECORD IS DUMPED OUT.
* W5. CLEAN UP.
* CHECK THE WRITE. USE W50.
* WRITE ANOTHER SENTINEL BLOCK.
* W6. END.
* REWIND TAPES, READ PASS2 AND EXECUTE IT.
* W50. PREVIOUS WRITE...
* SWITCH TESTS EXISTENCE OF PREVIOUS WRITE.
* IF NONE EXIT.
* W51. WAIT READY.
* WHEN TAPE IS FINISHED CHECK FOR ERRORS.
* IF OK SET SWITCH OFF AND EXIT.
* IF ERROR STOP THE READER (SECTION S),
* HALT, AND THEN EXIT.

```

IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

**Remington Rand Univac**  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.

0000  
0001  
0002  
0003  
0004  
0005  
0006  
0007  
0008  
0009  
0010  
0011  
0012  
0013  
0014  
0015  
0016  
0017  
0018  
0019  
0020  
0021  
0022  
0023  
0024  
0025  
0026  
0027  
0028  
0029  
0030  
0031  
0032  
0033  
0034  
0035  
0036  
0037  
0038  
0039  
0040  
0041  
0042  
0043  
0044  
0045  
0046  
0047  
0048

FLO

	BLR	0000	0399
BSAH	NEW1	00001	00000
50000	COR	0201	
60000	COR	0201	
70000	BLR	4800	4999
80000	COR	0014	
C0000	BLR	4030	4035
D0000	COR	0202	
E0000	COR	0006	
F0000	COR	0024	
I0000	COR	0010	
J0000	COR	0010	
L0000	BLR	4010	4015
M0000	BLR	4020	4025
Q0000	BLR	4000	4009
R0000	COR	0011	
U0000	COR	0004	
V0000	COR	0004	
W0000	EQU	5200	
X0000	COR	0006	
Y0000	EQU	7800	
Z0000	BLR	0989	0999
10000	COR	0005	
30000	COR	0007	
STAB	BLR	1000	1999
ETAB	BLR	2000	2999
A	COR	0001	
AH	COR	0001	
M	COR	0001	
MH	COR	0001	
C	COR	0001	
CH	COR	0001	

## 2. QADAAD ASSEMBLER PASS 2. TABLE OF CONTENTS

X	A. AJST* SUBROUTINE.
X	B. BEGINNING OF ASSEMBLY
X	C. CONTROL OPS.
X	D. DEFINE ADDRESS (DEFN*)
X	E. EDIT INPUT CARD
X	F. FIND AND RESERVE BEST LOCATION (FARB*)
X	L. PROCESS A ADDRESS.
X	O. OUTPUT SUBROUTINE.
X	P. PROCESSING OF INSTRUCTIONS.
X	Q. MASTER ADDRESS CALCULATOR (FIND*)
X	S. SYMBOL TABLE SEARCH (SRCH*)
X	X. EXAMINE REMARKS FIELD
X	Z. ENDING OF ASSEMBLY.
X	THIS PASS DOES THE ACTUAL ASSEMBLY.
X	THE SHOW BEGINS AT ROUTINE B.
G	CAUSES ASSEMBLY INTO B00A - B99F AREA.
G	INPUT BUFFER
G	INPUT BUFFER
G	OUTPUT BUFFER
G	BLA, BLR CONTROL
G	C ADDRESS CONTROL
G	DRUM AVAILABILITY TABLE
G	DEFN* CONTROL
G	FARB* CONTROL
G	FORWARD LOCAL TABLE
G	BACKWARD LOCAL TABLE
G	A ADDRESS CONTROL
G	M ADDRESS CONTROL
G	INDEX REGISTER CODES
G	REMARKS
G	H FIELDS
G	H FIELD CONTROL
G	EQU CONTROL
G	BAND FOR LOADING ROUTINE
G	BLANK COMMENTS
G	PAIR ADDRESS CONTROL
G	EDITING
G	SYMBOL TABLE
G	EQUIVALENTS TABLE
G	A FIELD ZZZZZNNNNN
G	AH FIELD 00ZZZOONNN

0049  
0050  
0051  
0052  
0053  
0054  
0055  
0056  
0057  
0058  
0059  
0060  
0061  
0062  
0063  
0064  
0065  
0066  
0067  
0068  
0069  
0070  
0071  
0072  
0073  
0074  
0075  
0076  
0077  
0078  
0079  
0080  
0081  
0082  
0083  
0084  
0085  
0086  
0087  
0088  
0089  
0090  
0091  
0092  
0093  
0094  
0095  
0096  
0097  
0098

ITAP1	EQU	0300
OTAP1	EQU	0500
OTAP2	EQU	0600
OTAP3	EQU	0700
COMTS	BLR	3400
CMTS1	EQU	3401
STOPT	EQU	W9801
EXIT	EQU	80FB
EXIT1	EQU	81FB
EXIT2	EQU	82FB
TEMP	EQU	83FB
TEMP1	EQU	84FB
TEMP2	EQU	85FB
ERROR	EQU	86FB
DEFX	EQU	87FB
UDEFX	EQU	88FB
SYMBL	EQU	89FB
INCRE	EQU	80FC
PANIC	EQU	81FC
MASK	EQU	82FC
CORE	EQU	83FC
BLANK	EQU	84FC
ALOC	EQU	85FC
MLOC	EQU	86FC
CLOC	EQU	87FC
DEXIT	EQU	88FC
SIGN	EQU	89FC
R	EQU	80FG
LINE	EQU	81FG
MCN	EQU	82FG
MCZ	EQU	83FG
MC	EQU	84FG
OP	EQU	85FG
IR	EQU	86FG
TAPE1	EQU	87FG
TCONT	EQU	88FG
LTAPE	EQU	89FG
TEX1	EQU	80FH
TEX	EQU	81FH
AEX	EQU	82FH
ALEV	EQU	83FH
MLEV	EQU	84FH
CLEV	EQU	85FH
HTAG	EQU	86FH
FTAG	EQU	87FH
RTAG	EQU	88FH
OPTIM	EQU	89FH
SHR1	EQU	80AC
SHR2	EQU	81AC
LC	EQU	82AC

3599

G	INPUT TAPE
G	OUTPUT TAPE
G	CONTROL FOR FLOW PASS -- PSEUDOCODE
G	COMMENTS FOR FLOW PASS
G	VARIOUS TEMP STORAGES
G	ERRORS ON CURRENT LINE
G	NUM CONSTANT
G	ZON CONSTANT
G	CON CONSTANT
G	LINE COUNTER IN INPUT BUFFER
G	CONTROL FOR TAPE BUFFER UNLOAD
G	LAST TAPE COMMAND
G	LINE COUNTER ON OUTPUT PAGE

0099  
0100  
0101  
0102  
0103  
0104  
0105  
0106  
0107  
0108  
0109  
0110  
0111  
0112  
0113  
0114  
0115  
0116  
0117  
0118  
0119  
0120  
0121  
0122  
0123  
0124  
0125  
0126  
0127  
0128  
0129  
0130  
0131  
0132  
0133  
0134  
0135  
0136  
0137  
0138  
0139  
0140  
0141  
0142  
0143  
0144  
0145  
0146  
0147  
0148

B679	888	0	HH	HHHH	HHHH
B3FH	888	0	00	0000	0000
B4FH	888	0	00	0000	0000
B5FH	888	0	00	0000	0000
B5FC	888	0	00	0000	0000
B6FC	888	0	00	0000	0000
B7FC	888	0	00	0000	0000
B7AC	888	0	00	0000	0000
B8AH	888	0	00	2000	0000
B4AB	888	0	22	2220	0000
B9AB	888	0	00	0000	4000
B712	888	0	60	B1FB	B00A
B00A	888	0	65	B2FB	B01A
B01A	888	0	50	B3FB	B02A
B02A	888	0	26	B713	B713
B713	888	0	75	0008	B03A
B03A	888	0	77	B03A	B04A
B04A	888	0	85	B714	B05A
B05A	888	0	32	0600	B06A
B06A	888	0	07	0HHH	B07A
B07A	888	0	35	000C	B08A

LINE0	EQU	B3AC
FLAG	EQU	B4AC
ACCUM	EQU	B5AC
MUMI	EQU	B6AC
MUML	EQU	B7AC
COMI	EQU	B8AC
KEY	EQU	B9AC
OK	EQU	B0AB
HSB	EQU	B4AB
HSB1	EQU	B9AB
BLA	EQU	B0AG
BLR	EQU	B1AG
COR	EQU	B2AG
PSUDX	EQU	B3AG
EQU	EQU	B4AG
HHH	EQU	B5AG
FLO	EQU	B6AG
END	EQU	B7AG
NEW	EQU	B8AG
CON	EQU	B0AH
NUM	EQU	B1AH
ZON	EQU	B2AH
PAT	EQU	B3AH
ALF	EQU	B4AH
OFF	EQU	B5AH
TYP	EQU	B6AH
FUNNY	EQU	B8AH
BOP1	EQU	B9AH
R0010	CON	HHHHH
ALEV	CON	00000
MLEV	CON	00000
CLEV	CON	00000
ALOC	CON	00000
MLOC	CON	00000
CLOC	CON	00000
MUML	CON	00000
FUNNY	CON	00200
HSB	CON	22222
HSB1	CON	00000
HHH		04000
SRCH*	STA	EXIT1
	STX	EXIT2
	STL	TEMP
	CLA	
	SUB	RL
	ATL	
	MUL#	10010
	SHR	0600
	IIR	0HHH
	ERS	RX

G LINE COUNTER IN OUTPUT BUFFER  
G ERRORS ON LAST ERRONEOUS LINE

G CONTROL OPS STARTING LOCATIONS

G B00A - B99F PART OF CORE USUALLY UNAVAILABLE  
G WHAT QADAAD CHOOSES FOR H  
G HIGH-SPEED BANDS

S. SYMBOL TABLE SEARCH (SRCH\*)  
THIS SUBROUTINE LOOKS UP A 5-CHARACTER QUANTITY TO SEE IF IT IS IN THE SYMBOL TABLE. OP-CODES, REGIONAL ADDRESSES, PAIR ADDRESSES, AS WELL AS SYMBOLIC ADDRESSES ARE KEPT IN THE SYMBOL TABLE. THERE ARE TWO EXITS, DEPENDING ON WHETHER THE SYMBOL IS OR IS NOT IN THE TABLE. ALL REFERENCES TO THE SYMBOL TABLE ARE MADE VIA SRCH\*.

S1. SCRAMBLE

01001

C

0149										
0150	B08A	888	0	30	B3FB	B716		LDL	TEMP	8SR2
0151										
0152	B716	888	0	20	B717	000A	8SR2	BUF		RA
0153	B717	888	0	08	0000	B715		LIR1	0000	-SR2
0154	B715	888	0	29	1000	B09A	-SR2	LDA1	STAB	
0155	B09A	888	0	82	B718	B10A		TEQ	3F	
0156	B10A	888	0	70	B719	B720		ADD		-SR1
0157	B719	888	0	99	9999	9999		CON	99999	99999
0158	B721	888	0	06	0023	B11A	8SR1	IIR1	0023	
0159	B11A	888	0	70	B722	B715		ADD		-SR2
0160	B722	888	0	99	9000	0000		CON	99900	00000
0161										
0162	B720	888	0	54	1000	B1FB	-SR1	STL1	STAB	EXIT1
0163	B718	888	0	29	2000	B2FB	3	LDA1	ETAB	EXIT2
0164										
0165										
0166										
0167										
0168										
0169										
0170										
0171										
0172										
0173										
0174	B723	888	0	50	B0FB	B12A	FARB*	STL	EXIT	
0175	B12A	888	1	09	B707	B13A		LDX3	AH	
0176	B13A	888	0	70	B724	B14A		ADD#	00000	10000
0177	B14A	888	0	60	B3FB	B15A		STA	TEMP	
0178										
0179	B15A	888	0	31	B725	B725		CLL		
0180	B725	888	0	50	B1FC	B16A		STL	PANIC	
0181	B16A	888	5	02	0000	B726		LIR6	0000	2F
0182	B726	888	0	30	000C	B727	2	LDL	RX	3F
0183	B727	888	0	50	B683	B17A	3	STL	U0003	
0184	B17A	888	0	25	B728	B18A		LDA#	00000	00888
0185	B18A	888	0	82	B729	B730		TEQ		3F
0186	B729	888	0	30	B6FH	B19A		LDL	HTAG	
0187	B19A	888	0	82	B684	B20A		TEQ	V0000	
0188	B20A	888	0	05	0008	B727		LDX	RL	3B
0189	B730	888	5	25	B680	B21A	3	LDA6	U0000	
0190	B21A	888	5	82	B684	B22A		TEQ6	V0000	
0191	B22A	888	5	07	0001	B730		IIR6	0001	3B
0192	B680	888	0	00	1000	0488	U0000	CON	00100	00488
0193	B681	888	0	00	1000	0388	U0001	CON	00100	00388
0194	B682	888	0	00	1000	0888	U0002	CON	00100	00888
0195	B687	888	0	25	0008	B23A	V0003	LDA	RL	
0196	B23A	888	0	75	000A	B24A		SUB	RA	
0197	B24A	888	0	31	B731	B731		CLL		
0198	B731	888	0	82	B732	B25A		TEQ	1F	

X THE SYMBOL IS CONVERTED TO A THREE-DIGIT NUMBER TO INDICATE WHERE THE SEARCH WILL START.  
X THIS SPEEDS UP THE SEARCH CONSIDERABLY.

## S2. SYMBOL:TABLE

EQ: IF THE SYMBOL IS AT THIS PLACE IN THE TABLE, GO TONDEF.

NEQ:

## S3. TABLE:ZERO

EQ: IF THE TABLE ENTRY IS ZERO,GO TONS4.

NEQ: OTHERWISE WE MOVE TO THE NEXT TABLE ENTRY  
X AND RETURN TONS2.

## S4. NOT FOUND.

WE HAVE ENCOUNTERED A NEW SYMBOL SINCE THE TABLE IS INITIALLY ALL ZEROES.

X STORE THE NEW SYMBOL IN THE TABLE HERE  
AND GO TONUNDEF.

## CODING DETAILS:

ON INPUT, RL IS THE SYMBOL, RA IS UNDEF.  
AND RX IS DEF. OUTPUT IN RB1 IS THE LOCATION IN THE TABLE, AND IF DEFINED THE EQUIVALENT OF THE SYMBOL APPEARS IN RA. THERE IS ROOM FOR 1000 SYMBOLS. IF THE 1001ST SYMBOL COMES ALONG, THE MACHINE LOOPS INDEFINITELY.

## F. FIND AND RESERVE BEST LOCATION (FARB\*)

THIS SUBROUTINE IS USED TO CHOOSE LOCATIONS FOR A H OR C ADDRESSES OF INSTRUCTIONS. THE CORRESPONDING H-FIELD IS INTERPRETED AND  
X THE CHOICE IS MADE ON THIS BASIS.

## F1. EXAMINE H-FIELD

C :IF IT SPECIFIES C(CORE) GO TONF4.

D :IF IT SPECIFIES D(DRUM) OR IS BLANK,  
GO TONF3 WITH RB6 SET TO 0.

H :IF IT SPECIFIES H(HIGH SPEED BANDS),  
GO TONF3 WITH RB6 EQUAL TO 2.

NNN:THREE NUMERICS OR +NN MEANS A HAND-PICKED LEVEL OR A CHANGE IN LEVEL ON THE DRUM,TONF2.

NN: TWO NUMERICS MEANS A HANDPICKED HIGH SPEED LEVEL, GO TONF2.

ERR: ANY OTHER MEANS THE H-FIELD IS IN ERROR.  
GO TONF3 AND TREAT AS BLANK.

0199	825A	888	0	30	8733	826A		LDA#	00000	00400
0200	826A	888	0	82	8734	827A		TEQ	3F	
0201	827A	888	1	06	0001	828A		IIR3	0001	
0202	828A	888	0	30	8735	8736		LDA		ERR1*
0203	8735	888	1	06	9999	8684		IIR3	9999	V0000
0204	8732	888	0	25	0008	829A	1	LDA	RL	
0205	829A	888	0	70	8737	8738		ADD		-NU
0206	8737	888	0	00	7000	0000		CON	00700	00000
0207	8739	888	0	70	83FB	830A	&NU	ADD	TEMP	
0208	830A	888	0	60	83FB	8684		STA	TEMP	V0000
0209	8738	888	5	07	9998	831A	-NU	IIR6	9998	
0210	831A	888	0	60	81FC	832A		STA	PANIC	
0211	832A	888	0	65	83FB	8740		STX	TEMP	2F
0212	8734	888	0	25	8741	833A	3	LDA#	00000	000HH
0213	833A	888	0	60	81FC	834A		STA	PANIC	
0214	834A	888	0	35	000C	835A		ERS	RX	
0215	835A	888	0	60	83FB	8740		STA	TEMP	2F
0216	8740	888	5	07	9999	8684	2	IIR6	9999	V0000
0217	8684	888	1	07	0000	8742	V0000	IIR2	0000	2F
0218	8686	888	1	07	0000	8742	V0002	IIR2	0000	2F
0219	8742	888	0	70	8743	8744	2	ADD		-F1
0220	8743	888	0	99	9995	0000		CON	99999	50000
0221	8744	888	0	26	8746	8746	-F1	CLA	3F	
0222	8745	888	5	07	0001	836A	&F1	IIR6	0001	
0223	836A	888	3	07	0000	8746		IIR5	0000	3F
0224	8746	888	0	60	84FB	8747	3	STA	TEMP1	-FARB
0225										
0226										
0227										
0228	8685	888	1	07	0000	837A	V0001	IIR2	0000	
0229	837A	888	0	70	8749	8750		ADD		-F8
0230	8749	888	0	99	9995	0000		CON	99999	50000
0231	8750	888	0	07	0001	8752	-F8	IIR	0001	1F
0232	8751	888	0	07	0002	8752	&F8	IIR	0002	1F
0233	8752	888	0	70	83FC	838A	1	ADD	CORE	
0234	838A	888	0	05	000A	839A		LDA	RA	
0235	839A	888	0	70	8753	8754		ADD		-F9
0236	8753	888	0	99	9000	0000		CON	99900	00000
0237	8754	888	0	65	83FC	840A	-F9	STX	CORE	
0238	840A	888	0	65	86AB	841A		STX	RB9	
0239	841A	888	8	07	8999	842A		IIR9	8999	
0240	842A	888	0	60	8695	843A		STA	10001	
0241	843A	888	8	07	0001	8756		IIR9	0001	FAREX
0242	8755	888	0	25	8758	844A	&F9	LDA#	00000	0000G
0243	844A	888	0	05	8759	8760		LDA		ERR2*
0244	8759	888	0	00	8761	8761		JMP		
0245	8761	888	5	07	0001	8686		IIR6	0001	V0002
0246	8747	888	0	25	83FB	845A	-FARB	LDA	TEMP	
0247	845A	888	0	37	0400	846A		SHL	0400	
0248	846A	888	0	70	84FB	847A		ADD	TEMP1	

F2. USE HAND LEVEL

THE H-FIELD SPECIFIES A HAND PICKED LEVEL. THIS SUPERCEDES THE LEVEL CALCULATED BY QADAAD; ALTHOUGH IT WILL BE CHECKED LATER BY THE AJST\* ROUTINE.

F3. ADJUST FOR PAIRS

IF RB2 CONTAINS 5 AT THIS POINT WE HAVE A PAIR ADDRESS; AND RB6 IS INCREASED BY 1. THE CALCULATED LEVEL IS ADJUSTED 1 IF IT IS A MINUS-PAIR ADDRESS. RB6 IS NOW EQUAL TO:

0: LOOK ON DRUM

1: LOOK FOR PAIR ON DRUM

2: LOOK FOR HIGH SPEED

X 3: LOOK FOR PAIR ADDRESS IN HIGH SPEED AREA

X THE SETTING OF RB6 IS USED TO CONTROL THE

X APPROPRIATE OPERATIONS BELOW. GO TO F6.

F4. ROOM IN CORE

IF RB2 CONTAINS 5 WE HAVE A PAIR ADDRESS AND MUST RESERVE 2 LOCATIONS; OTHERWISE 1 LOCATION IN CORE. IF THERE IS NO ROOM LEFT IN

NO: THE 8000-8999 AREA, A SEMICOLON ERROR

INDICATION IS GIVEN AND WE TRY HIGH SPEED

ACCESS BY GOING TO F3.

YES:

F5. ASSIGN CORE ADDR.

CALCULATE THE EQUIVALENT OF THIS ADDRESS AND THE ADDRESS ONE LESS IN CASE OF A PAIR ADDRESS. #EXIT.

F6. INITIALIZE

CALCULATE THE STARTING DRUM LEVEL, AND ALSO MAKE AN EXTRA COPY OF LEVEL 199 AS LEVEL -1



0249	847A	888	0	77	847A	848A
0250	848A	888	0	60	84AC	849A
0251	849A	888	5	00	8641	8641
0252	8642	888	0	85	8762	8763
0253	8641	888	0	85	8762	8763
0254	8762	888	0	00	0000	00A5
0255	8763	888	0	35	8764	850A
0256	850A	888	0	70	000A	8765
0257	8643	888	0	35	8766	8765
0258	8644	888	0	35	8766	8765
0259	8766	888	0	00	00CH	0000
0260	8765	888	0	60	86AB	851A
0261	851A	888	0	31	8767	8767
0262	8767	888	0	25	8617	852A
0263	852A	888	0	60	8417	8768
0264	8768	888	6	25	8418	853A
0265	853A	888	5	00	8629	8629
0266	8630	888	6	35	8417	8629
0267	8631	888	6	20	8468	854A
0268	854A	888	6	20	8518	855A
0269	855A	888	6	20	8568	8770
0270	8770	888	0	35	84AB	8629
0271	8632	888	6	35	8417	856A
0272	856A	888	0	05	000A	857A
0273	857A	888	6	25	8468	858A
0274	858A	888	6	35	8467	859A
0275	859A	888	0	20	000C	860A
0276	860A	888	0	05	000A	861A
0277	861A	888	6	25	8518	862A
0278	862A	888	6	35	8517	863A
0279	863A	888	0	20	000C	864A
0280	864A	888	0	05	000A	865A
0281	865A	888	6	25	8568	866A
0282	866A	888	6	35	8567	867A
0283	867A	888	0	20	000C	8770
0284	8629	888	0	82	8771	8772
0285	8771	888	0	25	81FC	868A
0286	868A	888	0	82	8773	869A
0287	869A	888	0	50	81FC	870A
0288	870A	888	0	25	8774	871A
0289	871A	888	0	05	8775	8760
0290	8775	888	0	00	8773	8773
0291	8773	888	6	07	0001	872A
0292	872A	888	5	70	8645	8768
0293	8645	888	0	99	9800	0000
0294	8646	888	0	99	9800	0000
0295	8647	888	0	99	9950	0000
0296	8648	888	0	99	9950	0000
0297	8769	888	0	25	84AC	873A
0298	873A	888	0	82	8776	874A

F0017  
F0016  
1  
2

F0018  
F0019  
1  
3

-F2

F0005  
F0006

1  
F0007

F0004

3  
F0020  
F0021  
F0022  
F0023  
&F2

ATL	
STA	FLAG
JMP6	F0016
MUL	1F
MUL	1F
CON	00000
ERSH	0000H
ADD	RA
ERS	1F
ERS	1F
CON	0000C
STA	RS7
CLL	
LDA	D0200
STA	D0000
LDA7	D0001
JMP6	F0004
ERS7	D0000
BUF7	D0051
BUF7	D0101
BUF7	D0151
ERS	H5B
ERS7	D0000
LDX	RA
LDA7	D0051
ERS7	D0050
BUF	RX
LDX	RA
LDA7	D0101
ERS7	D0100
BUF	RX
LDX	RA
LDA7	D0151
ERS7	D0150
BUF	RX
TEO	
LDA	PANIC
TEO	3F
STL	PANIC
LDAN	00000
LDX	
JMP	3F
IIR7	0001
ADD6	F0020
CON	99980
CON	99980
CON	99995
CON	99995
LDA	FLAG
TEO	1F

2F  
2F  
000A5  
H5000

3F  
3F  
3F  
H0000

-F2

F0004

1F  
F0004

1B  
2F

0000G  
ERR2\*

-F2

00000  
00000  
00000  
00000

IN CASE OF PAIR ADDRESS PROCESSING.

F7. TRY LEVEL  
OK: IF A DRUM ADDRESS SATISFYING ALL THE  
REQUIREMENTS INDICATED BY RB6 EXISTS ON THIS  
LEVEL, GO TONF9.

NO:

F8. DRUM EXHAUSTED  
IF THE LEVEL WAS HAND CALCULATED, A SEMICOLON  
ERROR IS INDICATED THE FIRST TIME STEP F8  
IS EXECUTED.  
YES: IF WE HAVE GONE ALL THE WAY AROUND THE DRUM.

A SEMICOLON ERROR IS GIVEN AND THE ADDRESS  
0000 IS ASSIGNED. TONF11.  
PARTIF WE HAVE EXHAUSTED THE HIGH SPEED BANDS,  
A SEMICOLON ERROR IS GIVEN AND WE TRY THE  
WHOLE DRUM, GOING TONF6.  
NO: OTHERWISE WE STEP TO THE NEXT DRUM LEVEL  
AND RETURN TONF7.



0299	874A	888	0	50	B4AC	875A	STL	FLAG	
0300	875A	888	6	02	0000	8768	LIR7	0000	-F2
0301	8776	888	0	25	8777	876A	LDAN	00000	0000G
0302	876A	888	0	05	8778	8760	LDX		ERR2*
0303	8778	888	0	00	8779	8779	JMP		
0304	8779	888	5	07	9998	877A	IIR6	9998	
0305	877A	888	0	70	8780	8747	ADD		-FARB
0306	8780	888	0	99	9998	0000	CON	99999	80000
0307	8748	888	0	26	8781	8781	CLA		
0308	8781	888	0	60	8695	8756	STA	10001	FAREX
0309	8772	888	5	00	8633	8633	JMP6	F0008	
0310	8635	888	6	25	8418	8782	LDA7	D0001	1F
0311	8782	888	0	35	84AB	878A	ERS	H5B	
0312	878A	888	0	82	8783	8784	TEQ		2F
0313	8783	888	6	07	0050	8772	IIR7	0050	2B
0314	8636	888	6	25	8418	879A	LDA7	D0001	
0315	879A	888	6	35	8417	8782	ERS7	D0000	1B
0316	8633	888	6	25	8418	8784	LDA7	D0001	2F
0317	8634	888	6	25	8418	880A	LDA7	D0001	
0318	880A	888	6	35	8417	8784	ERS7	D0000	2F
0319	8784	888	0	05	000A	881A	LDX	RA	
0320	881A	888	0	35	8785	882A	ERSH	GGGGG	GGGGG
0321	882A	888	0	82	8786	883A	TEQ	1F	
0322	883A	888	0	35	8787	884A	ERSH	99999	99999
0323	884A	888	0	82	8788	885A	TEQ	2F	
0324	885A	888	0	35	8789	886A	ERSH	55555	55555
0325	886A	888	0	82	8790	887A	TEQ	3F	
0326	887A	888	0	25	8791	8792	LDA		4F
0327	8791	888	0	CH	HHHH	HHHH	CON	CHHHH	HHHHH
0328	8790	888	0	25	8793	888A	LDAN	8HHHH	HHHHH
0329	888A	888	0	30	8794	8792	LDL		4F
0330	8794	888	0	00	2000	0000	CON	00200	00000
0331	8788	888	0	25	8795	889A	LDAN	FHHHH	HHHHH
0332	889A	888	0	30	8796	8792	LDL		4F
0333	8796	888	0	00	4000	0000	CON	00400	00000
0334	8786	888	0	25	8797	890A	LDAN	GHHHH	HHHHH
0335	890A	888	0	30	8798	8792	LDL		4F
0336	8798	888	0	00	6000	0000	CON	00600	00000
0337	8792	888	0	50	88AB	891A	STL	RB9	
0338	891A	888	0	30	000C	892A	LDL	RX	
0339	892A	888	0	05	8799	8800	LDX		1F
0340	8799	888	0	HH	HHHH	HHHH	CON	HHHHH	HHHHH
0341	8800	888	0	60	82FC	893A	STA	MASK	
0342	893A	888	0	35	000B	894A	ERS	RL	
0343	894A	888	0	82	8801	8802	TEQ		1F
0344	8801	888	8	07	0200	895A	IIR9	0200	
0345	895A	888	0	25	82FC	896A	LDA	MASK	
0346	896A	888	0	32	0100	8800	SHR	0100	1B
0347	8802	888	5	00	8637	8637	JMP6	F0012	
0348	8639	888	6	25	8418	897A	LDA7	D0001	

F9. CALCULATE ADDRESS  
WE TRY TO FIGURE OUT WHAT DRUM ADDRESS WE  
HAVE FOUND. PICKING THE SMALLEST ACCEPTABLE  
ADDRESS ON THIS LEVEL. A SINGLE WORD OF  
40 BITS IS KEPT FOR EACH DRUM LEVEL,  
CORRESPONDING TO BANDS 00 THRU 78. THE 5-BITS  
COVER BANDS 00 THRU 18. 4-BITS 20 THRU 38,  
AND SO ON.

F10. RESERVE ADDRESS.  
FOR A PAIR ADDRESS THE ADDRESS IN THIS BAND

0349	897A	888	0	35	B2FC	8637
0350	8638	888	6	25	B417	8803
0351	8640	888	6	25	B417	8803
0352	8803	888	0	35	B2FC	898A
0353	898A	888	6	60	B417	8639
0354	8637	888	6	60	B418	899A
0355	899A	888	0	25	B417	800F
0356	800F	888	0	35	8617	801F
0357	801F	888	0	60	8617	802F
0358	802F	888	6	07	0000	803F
0359	803F	888	0	31	8804	8804
0360	8804	888	0	82	8805	8806
0361	8805	888	0	07	0199	8807
0362	8806	888	0	75	8808	8807
0363	8808	888	0	00	0001	0000
0364	8807	888	0	70	88A8	804F
0365	804F	888	0	60	8695	805F
0366	805F	888	6	07	0000	806F
0367	806F	888	0	70	88A8	8756
0368	8756	888	0	06	8809	8809
0369	8809	888	0	60	8694	807F
0370	807F	888	0	60	8696	808F
0371	808F	888	0	32	0400	80FB
0372	8810	888	1	29	8706	809F
0373	809F	888	0	65	87FB	810F
0374	810F	888	0	50	88FB	811F
0375	811F	888	0	60	89FB	812F
0376	812F	888	0	30	8811	813F
0377	813F	888	0	82	8812	814F
0378	814F	888	0	30	8813	815F
0379	815F	888	0	82	8814	816F
0380	816F	888	0	35	8815	817F
0381	817F	888	0	30	8816	818F
0382	818F	888	0	82	8817	819F
0383	819F	888	0	25	89FB	820F
0384	820F	888	0	35	8818	821F
0385	821F	888	0	C1	821F	822F
0386	822F	888	0	20	8819	823F
0387	823F	888	0	35	89FB	824F
0388	824F	888	0	35	8820	825F
0389	825F	888	0	31	8821	8821
0390	8821	888	0	50	80FC	826F
0391	826F	888	0	82	8822	827F
0392	827F	888	0	25	89FB	828F
0393	828F	888	0	35	8823	829F
0394	829F	888	0	60	83AB	830F
0395	830F	888	0	35	8824	831F
0396	831F	888	0	C1	831F	832F
0397	832F	888	0	20	8825	833F
0398	833F	888	0	35	89FB	834F

	ERS	MASK	FO012
FO013	LDA7	D0000	1F
FO015	LDA7	D0000	1F
1	ERS	MASK	
	STA7	D0000	FO014
FO012	STA7	D0001	
	LDA	D0000	
	ERS	D0200	
	STA	D0200	
	IIR7	0000	
	CLL		
	TEQ		1F
	IIR	0199	2F
1	SUB		2F
	CON	00000	10000
2	ADD	RB9	
	STA	10001	
	IIR7	0000	
	ADD	RB9	FAREX
FAREX	CLX		
	STA	10000	
	STA	10002	
	SHR	0400	EXIT
FIND*	LDA3	A	
	STX	DEFX	
	STL	UDEFX	
	STA	SYMBL	
	LDLN	00000	BB888
	TEQ	BLNK	
	LDLN	20000	BB888
	TEQ	SELF	
	ERSN	H0000	H0000
	LDLN	00000	B0000
	TEQ	ABS	
	LDA	SYMBL	
	ERSN	00000	03333
	MTX		
	BUFN	0HHHH	00000
	ERS	SYMBL	
	ERSN	0HHHH	04444
	CLL		
	STL	INCRE	
	TEQ	REG	
	LDA	SYMBL	
	ERSN	00000	H0000
	STA	RB5	
	ERSN	00000	30000
	MTX		
	BUFN	HHHHH	0HHHH
	ERS	SYMBL	

ON TWO ADJACENT LEVELS IS RESERVED.  
OTHERWISE A SINGLE ADDRESS IS RESERVED, BY  
TURNING ITS BIT OFF IN THE TABLE. AFTER THE  
OPERATION, LEVELS -1 AND 199 ARE COMBINED  
AS LEVEL 199.

F11.FINISH UP  
CALCULATE THE ADDRESS ADJACENT TO THE ONE  
FOUND IN CASE OF A POSSIBLE MINUS-PAIR  
ADDRESS, AND EXIT.

CODING DETAILS:  
INDEX REGISTERS 1 2 AND 3 ARE NOT CHANGED BY  
FARB\*. ON INPUT THE H FIELD IS SPECIFIED  
BY RB3. THE CALCULATED BEST DRUM LEVEL IS IN  
RA. AND THE EXIT IS IN RL. THE OUTPUT  
LOCATION FOUND IS IN RA AND AN ADJACENT  
LOCATION IS STORED IN A SPECIAL TABLE.

Q. MASTER ADDRESS CALCULATOR (FIND\*)  
THIS SUBROUTINE IS GIVEN THE CONTENTS OF  
THE SYMBOLIC A.M. OR C FIELD OF THE CARD AND  
ANALYZES IT. THERE ARE TWO EXITS, ACCORDING  
TO WHETHER THE ADDRESS IS DEFINED OR NOT.

Q1. WHAT KIND  
BLK: IF BLANK GO TO#Q2.  
\*: IF SELF, GO TO#Q3.  
REG: IF FOUR RIGHTHAND PARTS ARE NUMERIC, TO#Q4.  
ABS: IF THE LEFTMOST CHARACTER IS BLANK, HOWEVER,  
GO TO#Q5.  
NF: IF LOCAL FORWARD ADDRESS, TO#Q7.  
NB: IF LOCAL BACKWARD ADDRESS, TO#Q8.  
N: IF LOCAL PLAIN ADDRESS N, TO#Q9.  
+-: IF PAIR ADDRESS, SET RB2 TO 5 AND GO TO#Q10.  
NX: IF THE SYMBOL FAILS TO PASS THE ABOVE AND  
BEGINS WITH A NUMERIC, GO TO#Q6.  
SYM: OTHERWISE IT IS SYMBOLIC: WE SET RB2 TO 4  
AND GO TO#Q10.

0399	834F	888	0	35	8826	835F
0400	835F	888	0	30	8827	836F
0401	836F	888	0	82	8828	837F
0402	837F	888	0	30	8829	838F
0403	838F	888	0	82	8830	839F
0404	839F	888	0	30	8831	840F
0405	840F	888	0	82	8832	841F
0406	841F	888	0	25	89FB	842F
0407	842F	888	0	35	8833	843F
0408	843F	888	0	30	8834	844F
0409	844F	888	0	82	8835	845F
0410	845F	888	0	30	8836	846F
0411	846F	888	0	82	8837	847F
0412	847F	888	0	31	8838	8838
0413	8838	888	0	35	8839	848F
0414	848F	888	0	82	8840	849F
0415	849F	888	1	02	0004	8841
0416	8837	888	3	02	0001	8842
0417	8835	888	3	02	0000	8842
0418	8842	888	1	02	0005	8841
0419	8812	888	0	31	8843	8843
0420	8843	888	0	25	84FC	850F
0421	850F	888	1	02	0002	8844
0422	8844	888	0	82	88FB	87FB
0423	8814	888	0	25	85FC	87FB
0424						
0425						
0426						
0427						
0428	8822	888	0	25	89FB	851F
0429	851F	888	0	35	8845	852F
0430	852F	888	0	60	80FC	853F
0431	853F	888	0	25	89FB	854F
0432	854F	888	0	35	8846	855F
0433	855F	888	1	02	0000	8847
0434	8817	888	0	25	89FB	856F
0435	856F	888	0	31	8848	8848
0436	8848	888	0	35	8849	857F
0437	857F	888	0	82	8850	8840
0438	8850	888	0	25	89FB	858F
0439	858F	888	0	35	8851	859F
0440	859F	888	0	75	000A	860F
0441	860F	888	0	82	8852	8840
0442	8840	888	0	30	8853	8736
0443	8853	888	0	26	87FB	87FB
0444	8852	888	0	25	89FB	861F
0445	861F	888	0	35	8854	862F
0446	862F	888	0	70	000A	863F
0447	863F	888	0	70	000A	864F
0448	864F	888	0	32	0500	865F

MINUS  
PLUS  
1  
BLNK

FEX  
SELF

REG

ABS

ADERR  
1

ERS#	HHHHH	4HHHH
LDL#	01000	06888
TEQ	LOCF	
LDL#	01000	02888
TEQ	LOCB	
LDL#	00000	08888
TEQ	LOCL	
LDA	SYMBL	
ERS#	H0000	H0000
LDL#	10000	C0000
TEQ	PLUS	
LDL#	00000	A0000
TEQ	MINUS	
CLL		
ERS#	H0000	00000
TEQ	ADERR	
LIR2	0004	LOOK1
LIR3	0001	1F
LIR5	0000	1F
LIR2	0005	LOOK1
CLL		
LDA	BLANK	
LIR2	0002	FEX
TEQ	UDEFX	DEFX
LDA	ALOC	DEFX
LDA	SYMBL	
ERS#	00000	0HHHH
STA	INCR	
LDA	SYMBL	
ERS#	H0000	H0000
LIR2	0000	LOOK
LDA	SYMBL	
CLL		
ERS#	02222	00000
TEQ		ADERR
LDA	SYMBL	
ERS#	HHHHH	0HHHH
SUB	RA	
TEQ	1F	ADERR
LDL		ERR1*
CLA	DEFX	
LDA	SYMBL	
ERS#	01111	00000
ADD	RA	
ADD	RA	
SHR	0500	

Q2. BLANKZERO  
EQL: IF 'BLANK' IS ZERO, THE BLANK ADDRESS IS  
UNDEFINED, AND WE GO TO#UNDEF.

NEQ: ELSE TONDEF.

Q3. 'A' LOCATION

X THE \* IS DEFINED AS THE VALUE OF A LOCATION.  
X IF IT APPEARS IN A, OR IN CERTAIN CONTROL OPS  
X IT IS THE VALUE OF THE PRECEDING A LOCATION.  
X TONDEF.

Q4. CHANGE TO R0000.

CHANGE THE REGIONAL ADDRESS TO R0000 AND SET  
R82 TO ZERO. WE GO THEN TO LOOK THIS UP  
IN THE SYMBOL TABLE, AT STEP#Q10.

Q5. PROCESS ABS ADDR.

BAD: IF ANY PART OF THE ADDRESS IS BLANK OR  
HAS ZONES OF 2 OR 3, GO TONQ6. OTHERWISE  
USE THE ZONES TO PRODUCE UNDIGITS FOR ABCFGH,  
OK: AND SEND THE RESULTING ADDRESS TONDEF.

Q6. ERROR

SET UP ERROR FLAG FOR CURRENT FIELD  
AND SET THE ADDRESS TO ZERO. TONDEF.

0449	865F	888	0	20	89FB	866F	BUF	SYMBL	
0450	866F	888	0	35	8855	87FB	ERS		DEFX
0451	8855	888	0	00	0000	HFFF	CON	00000	OHFFF
0452	8828	888	3	25	8649	867F	LOC	LDA5 10000	
0453	867F	888	0	31	8856	8856	CLL		
0454									
0455	8856	888	1	02	0001	8844	LIR2	0001	FEX
0456	8830	888	3	25	8659	868F	LOC	LDA5 J0000	
0457	868F	888	0	31	8857	8857	CLL		
0458									
0459									
0460	8857	888	0	82	8840	87FB	TEQ	ADERR	DEFX
0461	8832	888	3	25	8649	869F	LOC	LDA5 10000	
0462	869F	888	0	31	8858	8858	CLL		
0463	8858	888	3	50	8649	870F	STL5	10000	
0464	870F	888	1	02	0003	871F	LIR2	0003	
0465	871F	888	0	82	88FB	872F	TEQ	UDEFX	
0466	872F	888	3	60	8659	87FB	STA5	J0000	DEFX
0467	8841	888	0	25	89FB	8847	LOOK	LDA SYMBL	LOOK
0468	8847	888	0	77	8847	873F	ATL		
0469	873F	888	0	25	88FB	874F	LOA	UDEFX	
0470	874F	888	0	05	8859	8712	LDX		SRCH*
0471	8859	888	0	70	80FC	875F	ADD	INCR	
0472	875F	888	0	35	8860	87FB	ERS		DEFX
0473	8860	888	0	00	0000	HFFF	CON	00000	OHFFF
0474									
0475									
0476									
0477									
0478									
0479									
0480									
0481									
0482									
0483									
0484									
0485									
0486									
0487	8861	888	1	00	8619	8619	DEFN*	JMP2 E0000	
0488									
0489									
0490									
0491									
0492									
0493	8619	888	0	05	000A	876F	E0000	LOX RA	
0494	876F	888	0	25	8862	877F	LDA#	00000	10000
0495	877F	888	0	75	80FC	878F	SUB	INCR	
0496	878F	888	0	32	0F00	879F	SHR	0F00	
0497	879F	888	0	70	000C	880F	ADD	RX	
0498	880F	888	0	35	8863	8623	ERS		E0004

Q7. I(N):ZERO  
EQ: IF THE FORWARD LOCAL TABLE ENTRY FOR N IS  
X ZERO IT IS UNDEFINED, WE GO TO UNDEF. ELSE IT  
NEQ: IS DEFINED AND UNDEF.  
Q8. J(N):ZERO  
EQ: IF THE BACKWARD LOCAL TABLE ENTRY FOR N IS  
X ZERO IT IS UNDEFINED AND WE GO TO Q6 SINCE  
X THIS SHOULDN'T HAPPEN. ELSE IT IS A  
NEQ: DEFINED ADDRESS WHICH IS SENT TO UNDEF.  
Q9. I(N):ZERO  
EQ: IF THE FORWARD LOCAL TABLE ENTRY FOR N IS  
X ZERO THIS ADDRESS IS UNDEFINED, GO TO UNDEF.  
NEQ: ELSE IT IS DEFINED AND WE TRANSFER IT TO THE  
BACKWARD LOCAL TABLE AND EXIT TO UNDEF.  
IN EITHER CASE RESET FORWARD LOCAL ENTRY 0.  
Q10. SRCH\*  
SEARCH FOR THE ITEM IN THE SYMBOL TABLE.  
DEF: IF FOUND, GO TO UNDEF, ADJUSTING FOR REGIONAL  
ADDRESS IF NECESSARY. IF NOT FOUND, WE GO  
UND: TO UNDEF.

#### CODING DETAILS:

X INPUT TO FIND\* IS DEF IN RX AND UNDEF IN RL.  
X RB3 CONTAINS THE FIELD TO BE EXAMINED.  
AT EXIT DEF, RA CONTAINS THE DEFINED  
EQUIVALENT IN ITS C ADDRESS POSITION.  
X AT EXIT UNDEF, RB2 CONTAINS INFORMATION  
X ABOUT THE TYPE OF ADDRESS AS FOLLOWS:  
0: REGIONAL  
X 1: LOCAL FORWARD N IS IN RB5  
X 2: BLANK  
X 3: LOCAL PLAIN N IS IN RB5  
X J: SYMBOLIC SPOT IN SYMBOL TABLE IS RB1  
X K: PAIR ADDRESS RB5 IS 0 FOR &, 1 FOR -.  
D. DEFINE ADDRESS (DEFN\*)  
X THIS SUBROUTINE IS USED AFTER FIND\* HAS  
X DETERMINED AN ADDRESS IS UNDEFINED. IF THIS  
X IS NOT AN ERROR CONDITION, SOME WAY OF  
X CALCULATING AN ADDRESS, USUALLY FARB\*, IS  
X USED AND THEN THIS ROUTINE DEFN\* TAKES OVER.  
Q1. WHAT TYPE  
REG: IF THE ADDRESS TO BE DEFINED IS REGIONAL,  
GO TO Q2.  
NF: IF LOCAL FORWARD, ENTER IN I TABLE AND EXIT.  
BLK: IF BLANK, ENTER IN 'BLANK' AND EXIT.  
N: IF LOCAL PLAIN, ENTER IN J TABLE AND EXIT.



0499	8863	888	0	00	0000	HHHH		CON	00000	OHHHH
0500	8620	888	3	60	8649	0008	E0001	STA5	10000	RL
0501	8621	888	0	60	84FC	0008	E0002	STA	BLANK	RL
0502										
0503										
0504										
0505										
0506										
0507	8622	888	3	60	8659	0008	E0003	STA5	J0000	RL
0508	8623	888	0	64	2000	0008	E0004	STA1	ETAB	RL
0509	8624	888	0	50	88FC	881F	E0005	STL	DEXIT	
0510	881F	888	3	25	8694	882F		LDA5	10000	
0511	882F	888	0	06	8864	8864		CLX		
0512	8864	888	0	32	0400	883F		SHR	0400	
0513	883F	888	0	64	2000	884F		STA1	ETAB	
0514	884F	888	0	60	84FB	885F		STA	TEMP1	
0515	885F	888	0	29	1000	886F		LDA1	STAB	
0516	886F	888	3	00	8697	8697		JMP5	10003	
0517	8697	888	0	35	8865	8866	10003	ERS		IF
0518	8865	888	0	0H	HHHA	HHHH		CON	OHHHH	AHHHH
0519	8698	888	0	20	8867	8866	10004	BUF		IF
0520	8867	888	0	10	000C	0000		CON	10000	CO000
0521	8866	888	0	77	8866	887F	1	ATL		
0522	887F	888	0	25	8868	8712		LDA		SRCH*
0523	8868	888	0	00	8869	8869		JMP		
0524	8869	888	3	25	8695	888F		LDA5	10001	
0525	888F	888	0	06	8870	8870		CLX		
0526	8870	888	0	32	0400	889F		SHR	0400	
0527	889F	888	0	64	2000	890F		STA1	ETAB	
0528	890F	888	0	25	84FB	88FC		LDA	TEMP1	DEXIT
0529	8871	888	0	50	80FB	891F	AJST*	STL	EXIT	
0530										
0531										
0532										
0533										
0534										
0535										
0536	891F	888	0	30	000A	892F		LDL	RA	
0537	892F	888	0	25	8872	8873		LDA		8F
0538	8872	888	1	00	0000	0000		CON1	00000	00000
0539	8873	888	0	70	0008	893F	8	ADD	RL	
0540	893F	888	0	82	8874	894F		TEQ	1F	
0541	894F	888	0	25	89FH	80FB		LDA	OPTIM	EXIT
0542	8874	888	0	60	84FB	895F	1	STA	TEMP1	
0543	895F	888	0	70	8875	896F		ADD#	00000	10000
0544	896F	888	0	75	89FH	897F		SUB	OPTIM	
0545	897F	888	0	60	83FB	898F		STA	TEMP	
0546	898F	888	0	25	0008	899F		LDA	RL	
0547	899F	888	0	35	8876	8877		ERS#	00000	OH000
0548	8877	888	0	30	89AB	8878		LDL	HSB1	

SYM: IF SYMBOLIC, ENTER IN EQUIVALENTS TABLE, #EXIT  
+-1 IF PAIR ADDRESS, GO TO#D3.

D2. CALCULATE BASE  
X REGIONAL ADDRESSES ARE DEFINED ONLY BY  
X CONTROL OPS LIKE BLR. THE DEFINING ADDRESS  
X MINUS THE INCREMENT, THE ADDRESS CORRESPON-  
X DING TO R0000, IS STORED IN THE  
X EQUIVALENTS TABLE. #EXIT.

D3. STORE TWO.  
THE DEFINED ADDRESS IS STORED IN THE SYMBOL  
TABLE. THEN S IS CHANGED TO - OR VICE VERSA  
AND THAT SYMBOL PLUS ITS EQUIVALENT ARE ALSO  
STORED AWAY. THE ASSUMPTION IS MADE THAT  
FARB\* WAS USED TO CALCULATE THE ADDRESSES.  
#EXIT.

CODING DETAIL:  
THE EXIT IS INPUT IN RL AND THE CALCULATED  
ADDRESS IN RA. OTHER INPUTS ACTUALLY USED  
ARE RB2 TO TELL THE TYPE, AND RB1 AND RB5 TO  
GIVE EXTRA INFORMATION AS SUPPLIED BY THE  
FIND\* SUBROUTINE. AT EXIT, RA CONTAINS THE  
DEFINED EQUIVALENT.

A. AJST\* SUBROUTINE.  
X THIS SUBROUTINE IS PART OF THE WAY QADAAD  
X FINDS LATENCY. AJST\* IS USED ON M AND C  
X ADDRESSES. FIRST AN OPTIMUM LEVEL  
X 'OPTIM' IS CALCULATED BY QADAAD; AJST\* USES  
X THIS TO FIND THE CURRENT LEVEL, GIVEN THE  
X ACTUAL M OR C ADDRESS.

A1. WHAT TYPE ADDRESS  
000A IF THE ASSIGNED ADDRESS D HAS ANY UNDIGITS  
IT IS ASSUMED TO BE IMMEDIATE ACCESS AND  
'OPTIM' IS THE ANSWER. #EXIT.  
4000 IF THE ASSIGNED ADDRESS D IS ON THE HIGH-  
SPEED BANDS, GO TO#A2.  
0000 IF THE ASSIGNED ADDRESS D IS ON THE STANDARD  
PART OF THE DRUM, D IS THE ANSWER. GO TO#A3.

A2. FIGURE DRUM ROLL  
THE ANSWER IS D-OPTIM MODULO 50,  
ADDED TO OPTIM.

0549	8878	888	0	82	8879	8880
0550	8880	888	0	30	83FB	8881
0551	8881	888	0	85	8882	8883
0552	8883	888	0	30	000C	8884
0553	8884	888	0	25	8885	8886
0554	8885	888	0	99	0A00	0000
0555	8879	888	0	25	83FB	8887
0556	8887	888	0	35	8888	8889
0557	8889	888	0	77	8889	8890
0558	8890	888	0	70	89FH	8891
0559	8891	888	0	60	84FB	8892
0560	8892	888	0	25	8893	8886
0561	8893	888	0	00	0000	0048
0562	8886	888	0	87	8894	8895
0563	8895	888	0	25	8896	8897
0564	8897	888	0	05	8894	8760
0565	8894	888	0	25	84FB	8898
0566	8898	888	0	35	8899	80FB
0567	8899	888	0	00	0000	0HHH
0568	8900	888	0	50	8901	8903
0569	8903	888	0	77	8903	8904
0570	8904	888	0	25	83AC	8905
0571	8905	888	0	20	8906	000A
0572	8906	888	0	08	0000	8907
0573	8907	888	0	69	4803	8908
0574	8908	888	0	50	84FB	8909
0575	8909	888	0	65	85FB	8910
0576	8910	888	0	0G	0004	8911
0577	8911	888	0	60	83AC	8912
0578	8912	888	0	54	4797	8913
0579	8913	888	0	70	8914	8901
0580	8914	888	0	99	9800	0000
0581	8902	888	0	60	83AC	8915
0582	8915	888	0	05	8916	8917
0583	8917	888	0	30	8918	8919
0584	8918	888	0	C6	4800	8916
0585	8916	888	0	H2	0500	8901
0586	8920	888	0	65	81FB	8921
0587	8921	888	0	05	000A	8922
0588	8922	888	0	35	8923	8924
0589	8924	888	0	C1	8924	8925
0590	8925	888	0	35	000C	8926
0591	8926	888	0	35	8927	8928
0592	8928	888	0	70	8929	8930
0593	8930	888	0	77	8930	8931
0594	8931	888	0	20	8932	8933
0595	8933	888	0	35	000C	8934
0596	8934	888	0	05	000A	8935
0597	8935	888	0	25	8936	8937
0598	8937	888	0	35	000B	81FB

	TEG	1F	
	LDL	TEMP	
	MUL#	00000	0A005
	LDL	RX	
	LDA		2F
	CON	990A0	00000
1	LDA	TEMP	
	ERS#	00000	000CH
	ATL		
	ADD	OPTIM	
	STA	TEMP1	
	LDA		2F
	CON	00000	00048
2	TGR	1F	
	LDAN#	00000	0000A
	LDX	1F	ERR2*
1	LDA	TEMP1	
	ERS		EXIT
	CON	00000	00HHH
OTPT*	STL	-OEX	
	ATL		
	LDA	LINE0	
	BUF		RA
	LIR1	0000	
	STX1	70003	
	STL	TEMP1	
	STX	TEMP2	
	IIR1	0004	
	STA	LINE0	
	STL1	79997	
	ADD		-OEX
	CON	99980	00000
8OEX	STA	LINE0	
	LDX	2F	
	LDL		TSUB*
	TBL	70000	2F
2	TWR	OTAP1	-OEX
UNDG*	STX	EXIT1	
	LDX	RA	
	ERS#	33333	33333
	MTX		
	ERS	RX	
	ERS#	44444	44444
	ADD#	44444	44444
	ATL		
	BUF#	88888	88888
	ERS	RX	
	LDX	RA	
	LDAN	11111	11111
	ERS	RL	EXIT1

A3. CHECK BAD TIMING.  
IF D COMPARED TO OPTIM INDICATES A WAIT OF  
48 OR 49 ON HSB OR OF 198 OR 199 ON REST OF  
DRUM, THE ERROR FLAG - IS PUT ON THE LISTING.

CODING DETAILS:  
INPUT IS THE ASSIGNED ADDRESS IN RA AND THE  
EXIT IN RL. OUTPUT IN RA IS SOME LOCATION  
ON THE APPROPRIATE DRUM LEVEL.  
#EXIT.

0. OUTPUT SUBROUTINE.  
THIS ROUTINE IS USED TO TRANSMIT AN ASSEMBLED  
INSTRUCTION TO THE OUTPUT TAPE.

01. TRANSFER  
THE LOCATION IS IN THE FORM RRROSOAAAA WHERE  
RRR ARE RELOCATION DIGITS COPIED FROM THE  
CARD, S IS THE ASSEMBLED SIGN, AND AAAA IS  
THE ASSEMBLED LOCATION. MOVE THE LOCATION  
AND THE ASSEMBLED INSTRUCTION INTO THE  
OUTPUT BUFFER.

02. BUFFER FULL  
NO: IF THE BUFFER DOES NOT HAVE 50 INSTRUCTIONS,  
#EXIT.

YES:  
03. WRITE TAPE  
WRITE THE BUFFER OUT ON THE OUTPUT TAPE AND  
CLEAR THE BUFFER AGAIN.#EXIT.

G THIS IS AN EDITING SUBROUTINE WHICH TAKES  
G A TEN DIGIT WORD IN RA AND PRODUCES IN  
G COMPUTER CODE THE CONVENTIONAL NOTATION FOR  
G UNDIGITS, ABCFGH. THE ZONE WORD IS PUT INTO  
G RA, NUMERIC IN RX AT EXIT.

0599					
0600	4200	888	0 26	4203	4203
0601	4201	888	0 26	4203	4203
0602	4203	888	0 60	80FG	4207
0603	4207	888	0 60	89FC	4211
0604	4211	888	0 60	86FB	4215
0605	4215	888	0 29	8001	4220
0606	4220	888	0 05	000A	4224
0607	4224	888	0 75	81FG	4029
0608	4029	888	0 30	4231	4233
0609	4233	888	0 82	4036	4236
0610	4236	888	0 67	1111	4036
0611	4036	888	0 65	81FG	4040
0612					
0613					
0614					
0615					
0616					
0617					
0618	4040	888	0 29	8003	4045
0619	4045	888	0 09	8009	4400
0620	4400	888	0 32	0500	4208
0621	4208	888	0 20	4210	4212
0622	4212	888	0 60	0334	4436
0623	4436	888	0 25	000C	4240
0624	4240	888	0 20	4042	4044
0625	4044	888	0 60	0218	4420
0626	4420	888	0 29	8002	4225
0627	4225	888	0 09	8008	4230
0628	4230	888	0 32	0500	4038
0629	4038	888	0 60	0339	4041
0630	4041	888	0 65	0223	4425
0631	4425	888	0 29	8007	4430
0632	4430	888	0 20	4232	4234
0633	4234	888	0 09	8006	4039
0634	4039	888	0 60	0241	4043
0635	4043	888	0 65	0246	4048
0636	4048	888	0 29	8005	4403
0637	4403	888	0 20	4205	4407
0638	4407	888	0 09	8004	4412
0639	4412	888	0 60	0303	4405
0640	4405	888	0 65	0308	4410
0641					
0642	4410	888	1 02	0000	8938
0643	8938	888	0 29	8003	8940
0644	8940	888	0 06	8941	8941
0645	8941	888	0 32	0500	8942
0646	8942	888	1 60	8699	8943
0647	8943	888	0 25	80FG	8944
0648	8944	888	0 32	0900	8945

START  
STRT  
1

HHH		H
CLA	1F	
CLA	1F	
STA	R	
STA	SIGN	
STA	ERROR	
LDA1	8001	
LDX	RA	
SUB	LINE	
LDLH	00000	00001
TEQ	1F	
HLT	1111	1F
STX	LINE	

1

LDA1	8003	
LDX1	8009	
SHR	0500	
BUFH	88888	00000
STA	0334	
LDA	RX	
BUFH	00008	00008
STA	0218	
LDA1	8002	
LDX1	8008	
SHR	0500	
STA	0339	
STX	0223	
LDA1	8007	
BUFH	00000	00008
LDX1	8006	
STA	0241	
STX	0246	
LDA1	8005	
BUFH	00000	00008
LDX1	8004	
STA	0303	
STX	0308	
HHH		C
LIR2	0000	-ST
LDA1	8003	
CLX		
SHR	0500	
STA2	30000	
LDA	R	
SHR	0900	

-ST

#### E. EDIT INPUT CARD.

THIS IS WHERE THE PROCESSING OF EACH CARD STARTS. THE PURPOSE IS TO TAKE THE INFOR-

MATION FROM THE INPUT TAPE AND TRANSFER IT TO THE PRINTER AREA READY TO BE PRINTED AND ALSO EDIT IT INTO A FORM MORE DIGESTIBLE FOR ASSEMBLY PROCESSING.

THE CARDS ARE REPRESENTED AS 20 WORDS ON TAPE, A ZONE WORD IMMEDIATELY PRECEDING ITS CORRESPONDING NUMERIC.

X	0.1	LINE NUMBER
X	2.3	A AR AH AS 1111123330
X	4.5	M MR MH AS 1111123330
X	6.7	C CR CH AS 1111123330
X	8.9	OP IR AS 1112000000
X	10-19	REMARKS AS 0111111...

#### E1. CHECK LINE NO.

BAD: IF THE LINE NUMBER IS NOT EXACTLY 1 HIGHER THAN THE PRECEDING, STOP THE MACHINE AND THEN RETURN TO E1.

OK:

#### E2. TRANSFER

MOVE THE LEFT HALF OF THE CARD TO THE PRINTER AREA EDITING IT SLIGHTLY FOR READABILITY.

#### E3. SEPARATE OFF R, H.

EDIT THE A-AR-AH, M-MR-MH, C-CR-CH, CHANGING THE SYMBOLIC PORTION TO A SINGLE WORD WITH THE ZONES AT THE LEFT: ZZZZZNNNNN; ACCUMULATE THE R DIGITS, AND PUT THE H-FIELD INTO THE FORM 00ZZZ00NNN.

0649	8945	888	0	65	80FG	8946
0650	8946	888	0	06	8947	8947
0651	8947	888	0	32	0700	8948
0652	8948	888	1	60	8707	8949
0653	8949	888	0	29	8002	8950
0654	8950	888	0	35	8951	8952
0655	8952	888	1	60	8700	8953
0656	8953	888	1	20	8699	8954
0657	8954	888	1	60	8706	8955
0658	8955	888	0	29	8002	8956
0659	8956	888	0	37	0400	8957
0660	8957	888	0	35	8958	8959
0661	8959	888	1	20	8707	8960
0662	8960	888	1	60	8707	8961
0663	8961	888	0	06	0002	8962
0664	8962	888	1	07	0002	8963
0665	8963	888	0	70	8964	8938
0666	8964	888	0	99	9994	0000
0667						
0668	8939	888	0	29	8004	4244
0669	4244	888	0	60	8669	4248
0670	4248	888	0	29	8005	4603
0671	4603	888	0	20	4605	4607
0672	4607	888	0	60	8670	4411
0673	4411	888	0	29	8006	4016
0674	4016	888	0	60	8671	4620
0675	4620	888	0	29	8007	4625
0676	4625	888	0	60	8672	4229
0677	4229	888	0	29	8008	4434
0678	4434	888	0	60	8673	4238
0679	4238	888	0	29	8009	4243
0680	4243	888	0	60	8674	4047
0681	4047	888	0	29	8010	4202
0682	4202	888	0	60	8675	4206
0683	4206	888	0	29	8011	4611
0684	4611	888	0	60	8676	4415
0685	4415	888	0	29	8012	4070
0686	4070	888	0	60	8677	4424
0687	4424	888	0	29	8013	4429
0688	4429	888	0	60	8678	4433
0689	4433	888	0	25	8701	4037
0690	4037	888	0	37	0500	4245
0691	4245	888	0	20	8703	4049
0692	4049	888	0	60	82FG	4053
0693	4053	888	0	25	8704	4057
0694	4057	888	0	06	4610	4610
0695	4610	888	0	32	0500	4018
0696	4018	888	0	20	8702	4222
0697	4222	888	0	60	83FG	4026
0698	4026	888	0	35	4028	4630

&ST

STX	R	
CLX		
SHR	0700	
STA2	AH	
LDA1	8002	
ERS#	HHHHH	00000
STA2	30001	
BUF2	30000	
STA2	A	
LDA1	8002	
SHL	0400	
ERS#	00HHH	00000
BUF2	AH	
STA2	AH	
IIR1	0002	
IIR2	0002	
ADD		-ST
CON	99999	40000
HHH		H
LDA1	8004	
STA	R0000	
LDA1	8005	
BUF#	80000	00000
STA	R0001	
LDA1	8006	
STA	R0002	
LDA1	8007	
STA	R0003	
LDA1	8008	
STA	R0004	
LDA1	8009	
STA	R0005	
LDA1	8010	
STA	R0006	
LDA1	8011	
STA	R0007	
LDA1	8012	
STA	R0008	
LDA1	8013	
STA	R0009	
LDA	30002	
SHL	0500	
BUF	30004	
STA	MCN	
LDA	30005	
CLX		
SHR	0500	
BUF	30003	
STA	MCZ	
ERS#	11111	11111

E4. MOVE COMMENTS  
MOVE THE REMARKS FIELD INTO REGION R.

E5. CONSTRUCT CONSTANTS  
PUT TOGETHER THE M AND C FIELDS INTO  
POSITIVE CONSTANTS MC,MCZ,AND MCN AS THE  
CON NUM ZON CONTROL OPS ARE SUPPOSED TO DO.



0699	4630	888	0	70	000A	4235		ADD	RA	
0700	4235	888	0	70	000A	4440		ADD	RA	
0701	4440	888	0	20	B2FG	4444		BUF	MCN	
0702	4444	888	0	60	B4FG	4448		STA	MC	
0703	4448	888	0	29	8003	4253		LDA1	8003	
0704	4253	888	0	06	4406	4406		CLX		
0705	4406	888	0	32	0700	4216		SHR	0700	
0706	4216	888	0	30	000A	4270		LDL	RA	
0707	4270	888	0	29	8002	4075		LDA1	8002	
0708	4075	888	0	32	0700	4435		SHR	0700	
0709	4435	888	0	37	0500	4443		SHL	0500	
0710	4443	888	0	20	000B	4247		BUF	RL	
0711	4247	888	0	20	4249	4401		BUF#	88000	88000
0712	4401	888	0	60	B5FG	4055		STA	OP	
0713	4055	888	0	65	B6FG	4209		STX	IR	
0714	4209	888	0	06	0014	4213		IIR1	0014	2F
0715	4213	888	0	60	B7FG	4017	2	STA	TAPE1	
0716	4017	888	0	29	8000	4422		LDA1	8000	
0717	4422	888	0	31	4275	4275		CLL		
0718	4275	888	0	82	4228	4428		TEQ	6F	
0719	4428	888	0	09	8001	4633		LDX1	8001	
0720	4633	888	0	30	000C	8919		LDL	RX	TSUB*
0721	8201	888	0	G2	0300	4218	50200	TRD	ITAP1	
0722	4218	888	0	08	0201	4221		LIR1	0201	
0723	4221	888	0	25	4223	4475		LDA	TCON1	1F
0724	4223	888	0	F6	8001	4453	TCON1	TBU	50000	-5
0725	4454	888	0	67	8888	4453	85	HLT	8888	-5
0726	4453	888	0	60	8200	4257	-5	STA	50199	3F
0727	8402	888	0	G2	0300	4019	60200	TRD	ITAP1	
0728	4019	888	0	08	0000	4622		LIR1	0000	
0729	4622	888	0	25	4624	4475		LDA	TCON2	1F
0730	4624	888	0	F6	8202	4653	TCON2	TBU	60000	-6
0731	4654	888	0	67	8888	4653	86	HLT	8888	-6
0732	4653	888	0	60	8401	4257	-6	STA	60199	3F
0733	4257	888	0	31	4060	4060	3	CLL	3F	
0734	4475	888	0	60	88FG	4629	1	STA	TCONT	
0735	4629	888	0	06	0000	4083		IIR1	0000	
0736	4083	888	0	60	B7FG	4228		STA	TAPE1	6F
0737	8919	888	0	50	B0FH	4423	TSUB*	STL	TEX1	1F
0738	4423	888	0	65	B1FH	4027		STX	TEX	*
0739	4027	888	0	C7	4432	4027	1	TBT		
0740	4432	888	0	26	4635	4635		CLA		
0741	4635	888	0	82	4438	4638		TEQ	2F	
0742	4638	888	0	25	B9FG	4242		LDA	LTAPE	
0743	4242	888	0	67	2222	000A		HLT	2222	RA
0744	4438	888	0	25	B8FG	4442	2	LDA	TCONT	
0745	4442	888	0	31	4445	4445		CLL		
0746	4445	888	0	82	4060	000A		TEQ	3F	RA
0747	4060	888	0	50	B8FG	4402	3	STL	TCONT	
0748	4402	888	0	25	B1FH	4606		LDA	TEX	

E6. EDIT OP CODE.  
PUT THE OPERATION CODE FIELD INTO THE FORM  
88ZZZ88NNN. THIS FORM IS USED BECAUSE IT  
CANNOT CONFLICT WITH ANY SYMBOL IN THE  
SYMBOL TABLE.  
PUT THE IR FIELD INTO THE FORM Z000000N00.

E7. INPUT BUFFER EMPTY  
NO: IF THE CURRENT INPUT BUFFER IS NOT YET  
EMPTY, GO TO E9.  
YES:

E8. SWAP BUFFERS  
AN INPUT BUFFER HAS ALREADY BEEN LOADED  
WE SWAP INPUT BUFFERS AND INITIATE READING IN  
TO THE EMPTY BUFFER.

G TAPE SUBROUTINE. RL IS EXIT; RX IS TAPE INST.

G WAIT UNTIL PREV TAPE INSTRUCTION CLEARS.

G HALT IF INDICATOR LIGHT ON

G IF PRECEDING WAS A READ, UNLOAD BUFFER

G PUT NEXT TAPE INSTRUCTION INTO LTAPE

0749	4606	888	0	35	4408	4260	ERS#	HHHHH	H0000
0750	4260	888	0	20	4612	4214	SUF		8F
0751	4612	888	0	00	0000	4027	JMP	0000	1B
0752	4214	888	0	60	89FG	80FH	STA	LTAPE	TEX1
0753	4228	888	0	30	85FG	4632	LDL	OP	
0754	4632	888	0	25	4634	4636	LDAN	88220	88658
0755	4636	888	0	82	4239	4439	TEQ	ONN	SWICH
0756	4056	888	1	08	0006	4409	LIR3	0006	
0757	4409	888	0	05	4061	4413	LDX	1F	
0758	4413	888	0	25	4615	8712	LDA		SRCH*
0759	4615	888	0	30	4219	8736	LDL		ERR1*
0760	4219	888	0	25	4623	4675	LDAN	67220	00000
0761	4675	888	0	64	2000	4061	STA1	ETAB	1F
0762	4061	888	0	30	4613	4065	LDL#	CCCCC	CCCCC
0763	4065	888	0	87	4418	000A	TGR		RA
0764	4418	888	0	60	85FG	4072	STA	OP	
0765	4072	888	0	30	4074	4226	LDL	PROCH	PROCA
0766							HMH		H
0767	4226	888	1	08	0000	4079	LIR3	0000	
0768	4079	888	0	50	82FH	4283	STL	AEX	
0769	4283	888	0	25	8706	4237	LDA	A	
0770	4237	888	0	30	4639	4241	LDL#	00000	88888
0771	4241	888	0	82	4644	4094	TEQ	1F	
0772	4094	888	0	31	4447	4447	CLL		
0773	4447	888	0	25	84FC	4601	LDA	BLANK	
0774	4601	888	0	82	4644	4204	TEQ	1F	
0775	4204	888	0	30	4644	8736	LDL	1F	ERR1*
0776	4644	888	0	05	4648	4600	LDX	2F	
0777	4600	888	0	30	4602	8810	LDL		FIND*
0778	4602	888	1	00	4010	4010	JMP2	L0000	
- 0779	4010	888	1	02	0002	4012	LIR2	0002	L0002
- 0780	4011	888	1	02	0002	4012	LIR2	0002	L0002
0781	4012	888	0	30	4014	8736	LDL	L0004	ERR1*
0782	4013	888	0	25	81FG	4217	LDA	LINE	1F
- 0783	4014	888	0	25	81FG	4217	LDA	LINE	1F
- 0784	4015	888	0	25	81FG	4217	LDA	LINE	1F
0785	4217	888	0	30	4419	8723	LDL		FARB*
0786	4419	888	0	30	4648	8861	LDL	2F	DEFN*
0787	4648	888	0	60	85FC	4404	STA	ALOC	
0788	4404	888	0	30	86FC	4608	LDL	MLOC	
0789	4608	888	0	82	4261	4461	TEQ	3F	
0790	4461	888	0	30	87FC	4265	LDL	CLOC	
0791	4265	888	0	82	4618	4068	TEQ	4F	2F
0792	4618	888	0	25	85FH	4272	LDA	CLEV	1F
0793	4261	888	0	30	87FC	4465	LDL	CLOC	
0794	4465	888	0	25	4417	4619	LDA		8F
0795	4417	888	1	00	0000	0000	CON1	00000	00000
0796	4619	888	0	70	0008	4274	ADD	RL	
0797	4274	888	0	82	4227	4618	TEQ		4B
0798	4227	888	0	25	84FH	4272	LDA	MLEV	1F

E9. OP SRCH\*.  
ON: IF OP IS 'ON' GO TO#C6.  
OFF: IF MASTER SWITCH IS OFF GO TO#C7.  
ELSE SEARCH FOR OP-CODE IN THE SYMBOL TABLE.  
CONT IF IT IS A CONTROL OP, GO TO#C1.  
SYM: IF IT IS A MACHINE SYMBOLIC OP, GO TO THE  
MAIN PROCESSING ROUTINE#P1.  
BAD: IF IT IS NOT IN THE TABLE, GIVE AN ERROR  
INDICATION AND CHANGE OP TO 67. GO TO #P1.

L. PROCESS A ADDRESS.  
THIS ROUTINE IS USED FOR INSTRUCTIONS AND  
ALSO FOR CONTROL OPS CON:NUM, AND ZON.  
L1. CHECK BLANK A  
IF A IS NOT BLANK BUT THE PRECEDING INSTRU-  
TION HAD A BLANK ADDRESS, GIVE AN ERROR  
INDICATION.

L2. FIND\* A.  
DEF: FIND A (ROUTINE Q). IF IT IS ALREADY DEFINED,  
GO TO#L4.  
UND:

L3. FARB\*,DEFN\*.  
A IS AN UNDEFINED ADDRESS. IF IT IS REGIONAL,  
LOCAL FORWARD, OR BLANK THIS IS AN ERROR  
CONDITION AND A NEW LOCATION IS ASSEMBLED.  
OTHERWISE USE THE LINE NUMBER AS RANDOM DRUM  
LEVEL AND GO THRU FARB\* (ROUTINE F) AND  
DEFN\* (ROUTINE D).

L4. ADJUST A LEVEL.  
IF THE NEW A ADDRESS MATCHES THE LAST M OR C  
ADDRESS, USE THEIR LEVEL, EXCEPT ON M ADDRESS  
MATCH WHERE THE C ADDRESS HAD UNDIGITS. IN  
THE LATTER CASE THE PREVIOUS C LEVEL IS USED.  
OTHERWISE USE THE A ADDRESS AS THE DRUM LEVEL

0799	4272	888	0	60	83FH	4426	1	STA	ALEV	
0800	4426	888	0	31	4279	4279		CLL		
0801	4279	888	0	50	84FC	82FH		STL	BLANK	AEX
0802										
0803										
0804	4068	888	0	25	4470	4472	2	LDA		8F
0805	4470	888	1	00	0000	0000		CON1	00000	00000
0806	4472	888	0	70	85FC	4272	8	ADD	ALOC	1B
0807	4074	888	0	25	86FG	4628	PROCM	LDA	IR	
0808	4628	888	0	30	4080	4082		LDL#	00000	00800
0809	4082	888	0	82	4085	4285		TEQ	1F	
0810	4285	888	0	30	4437	4089		LDL#	10000	00H00
0811	4089	888	0	82	4085	4642		TEQ	1F	
0812	4642	888	0	25	83FH	4046		LDA	ALEV	
0813	4046	888	0	70	4098	4051		ADD#	00000	00001
0814	4051	888	0	60	83FH	4085		STA	ALEV	1F
0815	4085	888	0	25	85FG	4289	1	LDA	OP	
0816	4289	888	0	32	0200	4294		SHR	0200	
0817	4294	888	0	35	4246	4298		ERS#	00000	000HH
0818	4298	888	0	70	83FH	4103		ADD	ALEV	
0819	4103	888	0	60	89FH	4457		STA	OPTIM	
0820	4457	888	1	08	0002	4460		LIR3	0002	
0821	4460	888	0	25	86FG	4414		LDA	IR	
0822	4414	888	0	30	4416	4268		LDL#	10000	00H00
0823	4268	888	0	82	4421	4621		TEQ	5F	
0824	4621	888	0	37	0200	4626		SHL	0200	
0825	4626	888	0	31	4479	4479		CLL		
0826	4479	888	0	06	4282	4282		CLX		
0827	4282	888	0	70	4084	000A		ADD	3F	RA
0828	4084	888	0	25	4000	4052	3	LDA	00000	4F
0829	4000	888	0	00	0000	0000	00000	CON	00000	00000
0830	4001	888	0	40	0000	0000	00001	CON	40000	00000
0831	4002	888	0	00	0000	0001	00002	CON	00000	00001
0832	4003	888	0	40	0000	0001	00003	CON	40000	00001
0833	4004	888	0	00	0000	0002	00004	CON	00000	00002
0834	4005	888	0	00	0000	0003	00005	CON	00000	00003
0835	4006	888	0	00	0000	0005	00006	CON	00000	00005
0836	4007	888	0	00	0000	0006	00007	CON	00000	00006
0837	4008	888	0	00	0000	0007	00008	CON	00000	00007
0838	4009	888	0	00	0000	0008	00009	CON	00000	00008
0839	4052	888	0	60	89FC	4256	4	STA	SIGN	
0840	4256	888	0	32	0100	4660		SHR	0100	
0841	4660	888	0	20	85FG	4614		SUF	OP	
0842	4614	888	0	60	85FG	4468		STA	OP	PRCM1
0843	4421	888	0	25	89FH	4125	5	LDA	OPTIM	
0844	4125	888	0	30	4427	8723		LDL		FARB*
0845	4427	888	0	60	86FC	4483		STA	MLOC	
0846	4483	888	0	30	4485	8871		LDL		AJST*
0847	4485	888	0	60	84FH	4441		STA	MLEV	
0848	4441	888	0	25	86FC	4645		LDA	MLOC	

L5. ZERO TO BLANK.  
THE LOCATION 'BLANK' IS SET TO ZERO SINCE AT  
X THIS POINT BLANK ADDRESSES ARE UNDEFINED.  
X #EXIT.

P. PROCESSING OF INSTRUCTIONS

P1. PROCESS A

EXECUTE THE L ROUTINE.

P2. CALCULATE M OPTIM

IF THE IR FIELD IS NON BLANK AND NOT A  
LITERAL, ADD 1 TO A LEVEL FOR INDEX REGISTER  
MODIFICATION TIME. THEN ADD THE APPROPRIATE  
AMOUNT TO GET THE OPTIMUM M ADDRESS LEVEL,  
AS DETERMINED BY THE OPERATION CODE.  
PUT THIS IN 'OPTIM'.

P3. LITERAL

YES: IF THE IR FIELD CONTAINS A NUMBER SIGN GO TO  
#P5.

NO:

P4. FIGURE INDEXING

ADJUST BIT 4 OF THE OPERATION CODE AND  
THE SIGN OF THE RESULT TO GIVE THE INDEX  
REGISTER MODIFICATION DESIRED. GO TO #P6.

P5. CREATE CONSTANT

GO THRU FARB\* AND AJST\* (ROUTINES F AND A)  
TO DETERMINE AN ADDRESS AND DRUM LEVEL FOR  
THE LITERAL CONSTANT. ASSEMBLE THE POSITIVE  
CONSTANT INTO THIS LOCATION: (ROUTINE O)  
TRANSFERRING THE MR DIGIT INTO AN AR DIGIT

0849	4645	888	0	32	0800	4456	SHR	0800		
0850	4456	888	0	25	80FG	4110	LDA	R		
0851	4110	888	0	35	4062	4064	ERS#	00000	000H0	
0852	4064	888	0	32	0200	4069	SHR	0200		
0853	4069	888	0	25	84FG	4073	LDA	MC		
0854	4073	888	0	30	4325	8900	LDL		0TPT*	
0855	4325	888	0	25	4679	4431	LDAN	00000	888B3	
0856	4431	888	0	60	8710	4685	STA	C	PROCC	
0857	4468	888	0	05	4670	4672	LDX	2F		
0858	4672	888	0	30	4474	8810	LDL		FIND*	
0859	4474	888	0	31	4129	4129	CLL			
0860	4129	888	1	00	4020	4020	JMP2	M0000		
0861	4022	888	0	25	85FG	4076	LDA	OP		
0862	4076	888	0	35	4078	4280	ERS#	00020	00000	
0863	4280	888	0	82	4021	4683	TEQ	M0001		
0864	4683	888	0	25	85FC	4670	LDA	ALOC	2F	
0865	4020	888	0	30	4122	8736	LDL	1F	ERR1*	
0866	4023	888	0	30	4122	8736	LDL	1F	ERR1*	
0867	4122	888	0	26	4670	4670	CLA	2F		
0868	4025	888	0	25	89FH	4329	LDA	OPTIM	1F	
0869	4024	888	0	25	89FH	4329	LDA	OPTIM	1F	
0870	4021	888	0	25	89FH	4329	LDA	OPTIM	1F	
0871	4329	888	0	30	4631	8723	LDL		FARB*	
0872	4631	888	0	30	4670	8861	LDL	2F	DEFN*	
0873	4670	888	0	60	86FC	4276	STA	MLOC		
0874	4276	888	0	30	4278	8871	LDL		AJST*	
0875	4278	888	0	60	84FH	4685	STA	MLEV	PROCC	
0876	4685	888	0	25	85FG	4489	LDA	OP		
0877	4489	888	0	35	4641	4643	ERS#	00H00	00000	
0878	4643	888	0	70	4095	4498	ADD		-C1	
0879	4095	888	0	99	7000	0000	CON	99700	00000	
0880	4499	888	0	25	86FC	4303	LDA	MLOC		
0881	4303	888	0	30	4255	4657	LDL#	00000	00F00	
0882	4657	888	0	82	4310	4510	TEQ		1F	
0883	4310	888	0	25	4262	4510	LDA		1F	
0884	4262	888	0	00	0000	1000	CON	00000	01000	
0885	4510	888	0	06	4063	4063	CLX			
0886	4063	888	0	32	0200	4668	SHR	0200		
0887	4668	888	0	70	85FG	4273	ADD	OP		
0888	4273	888	0	60	85FG	4477	STA	OP	8C2	
0889										
0890	4498	888	0	30	4251	4503	LDL#	99800	00000	
0891	4503	888	0	82	4656	4106	TEQ		3F	
0892	4656	888	0	25	85FG	4710	LDA	OP		
0893	4710	888	0	35	4462	4264	ERS		2F	
0894	4462	888	0	00	0000	HMMH	CON	00000	0HMMH	
0895	4106	888	0	70	4058	4476	ADD		-C2	
0896	4058	888	0	00	1000	0000	CON	00100	00000	
0897	4477	888	0	30	83FH	4081	LDL	ALEV	3F	
0898	4476	888	0	30	84FH	4081	LDL	MLEV	3F	

FOR THE CONSTANT.  
MARK THE C FIELD BLANK AND GO TO#P9.

P6. FIND\* M.  
DEF: FIND M(ROUTINE Q). IF IT IS ALREADY DEFINED,  
GO TO#P8.

UND:

P7. FARB\*, DEFN\*.  
M IS AN UNDEFINED ADDRESS. IF IT IS  
REGIONAL OR LOCAL PLAIN THIS IS AN ERROR  
CONDITION AND ZERO IS ASSEMBLED. IF IT IS  
BLANK AND IF THE OP-CODE IS ONE THAT IGNORES  
M: \* IS ASSEMBLED.  
OTHERWISE FARB\* AND DEFN\* (ROUTINES F,D) ARE  
USED TO DEFINE M ON THE BASIS OF OPTIM AND  
THE MH-FIELD.

P8. ADJUST M LEVEL  
THE DRUM LEVEL AT THIS POINT IS NOW  
DETERMINED BY SUBROUTINE A.

P9. CALCULATE C OPTIM  
WE BEGIN TO WORK ON THE C ADDRESS NOW.  
THE OP CODE FOUND IN THE SYMBOL TABLE IS IN A  
SPECIAL FORMAT OPT500MMCC.  
HERE OP IS THE TWO DIGIT OPERATION CODE.  
S IS 1 FOR IGNORE C; 2 FOR IGNORE M.  
MM AND CC ARE INCREMENTS FOR DETERMINING  
LATENCY. T IS THE TYPE OF LATENCY RULE  
REQUIRED, AS FOLLOWS:

X 0: C IS MMCC FIXED LEVEL.  
1: C IS MMCC FIXED LEVEL.  
2: C IS A+CC  
3: SHIFT COMMANDS C IS A+N+CC.

WE NOW CALCULATE OPTIM FOR C, ACCORDING TO  
THE RULE GIVEN BY T.



0899	4081	888	0	25	B5FG	4135	3	LDA	OP		
0900	4135	888	0	35	4637	4689		ERS#	00000	000HH	
0901	4689	888	0	70	0008	4264		ADD	RL	2F	
0902	4264	888	0	60	B9FH	4118	2	STA	OPTIM		
0903	4118	888	1	08	0004	4071		LIR3	0004		
0904	4071	888	0	05	4473	4525		LDX	2F		
0905	4525	888	0	30	4627	8810		LDL		FIND*	
0906	4627	888	1	00	4030	4030		JMP2	C0000		
0907	4033	888	0	30	4335	8736	C0003	LDL	1F	ERR1*	
0908	4030	888	0	30	4335	8736	C0000	LDL	1F	ERR1*	
0909	4335	888	0	26	4473	4473	1	CLA	2F		
0910	4032	888	0	25	B5FG	4086	C0002	LDA	OP		
0911	4086	888	0	35	4088	4640		ERS#	00010	00000	
0912	4640	888	0	31	4093	4093		CLL			
0913	4093	888	0	82	4446	4646		TEQ	1F		
0914	4646	888	0	25	B6FC	4473		LDA	MLOC	2F	
0915	4446	888	0	07	0010	4449	1	IIR	0010		
0916	4449	888	0	70	B8AH	4604		ADD	FUNNY		
0917	4604	888	0	30	4306	4258		LDL#	00199	00000	
0918	4258	888	0	87	4031	4661		TGR	C0001		
0919	4661	888	0	60	B8AH	4665		STA	FUNNY		
0920	4665	888	0	05	000A	4269		LDX	RA		
0921	4269	888	0	70	4271	4724		ADD		-FNNY	
0922	4271	888	0	99	9000	0000		CON	99900	00000	
0923	4725	888	0	20	4077	4529	&FNNY	BUF		1F	
0924	4077	888	0	00	B00F	0000		CON	00800	F0000	
0925	4724	888	0	07	B00A	4277	-FNNY	IIR	B00A		
0926	4277	888	0	20	000C	4529		BUF	RX	1F	
0927	4529	888	0	32	0400	4286	1	SHR	0400	3F	
0928	4035	888	0	25	B9FH	4139	C0005	LDA	OPTIM	1F	
0929	4034	888	0	25	B9FH	4139	C0004	LDA	OPTIM	1F	
0930	4031	888	0	25	B9FH	4139	C0001	LDA	OPTIM	1F	
0931	4139	888	0	30	4286	8723	1	LDL	3F	FARB*	
0932	4286	888	0	30	4473	8861	3	LDL	2F	DEFN*	
0933	4473	888	0	60	B7FC	4729	2	STA	CLOC		
0934	4729	888	0	30	4281	8871		LDL		AJST*	
0935	4281	888	0	60	B5FH	4087		STA	CLEV	BUILD	
0936	4087	888	0	25	B7FC	4091	BUILD	LDA	CLOC		
0937	4091	888	0	32	0400	4698		SHR	0400		
0938	4698	888	0	25	B6FC	4252		LDA	MLOC		
0939	4252	888	0	32	0600	4111		SHR	0600		
0940	4111	888	0	25	B5FG	4115		LDA	OP		
0941	4115	888	0	35	4617	4469		ERS#	HH000	00000	
0942	4469	888	0	20	000C	4673		BUF	RX		
0943	4673	888	0	77	4673	4676		ATL		BILD1	
0944	4676	888	0	25	B5FC	4480	BILD1	LDA	ALOC		
0945	4480	888	0	06	4133	4133		CLX			
0946	4133	888	0	32	0500	4291		SHR	0500		
0947	4291	888	0	25	B9FC	4295		LDA	SIGN		
0948	4295	888	0	32	0200	4050		SHR	0200		

P10.FIND\* C.  
DEF: FIND C(ROUTINE G). IF IT IS ALREADY DEFINED,  
GO TO#P12.

UND:  
P11.FARB\*,DEFN\*.  
C IS AN UNDEFINED ADDRESS. IF IT IS  
REGIONAL OR LOCAL PLAIN: THIS IS AN ERROR  
CONDITION AND ZERO IS ASSEMBLED.  
IF IT IS BLANK AND THE OP-CODE IGNORES C,  
IT IS MADE EQUAL TO M. OTHERWISE FARB\* AND  
DEFN\* (ROUTINES F,D) ARE ACTIVATED TO DEFINE  
C ON THE BASIS OF OPTIM.  
BLANK ADDRESS HERE MAY BE PUT IN B00A  
OR B00F REGION OF CORE.

P12.ADJUST C LEVEL  
THE DRUM LEVEL AT THIS POINT IS NOW  
DETERMINED BY SUBROUTINE A.  
P13. SYNTHESIZE  
THE OP, M AND C ARE NOW PUT TOGETHER  
INTO A TEN-DIGIT INSTRUCTION.

P14.ASSEMBLE  
USE ROUTINE D TO OUTPUT THE ASSEMBLED  
LINE OF CODE.

0949	4050	888	0	25	80FG	4054
0950	4054	888	0	32	0300	4160
0951	4160	888	0	25	0008	4464
0952	4464	888	0	30	4616	8900
0953	4616	888	0	25	84FB	4322
0954	4322	888	0	05	4674	8920
0955	4674	888	0	65	84FB	4680
0956	4680	888	0	06	4333	4333
0957	4333	888	0	32	0400	4090
0958	4090	888	0	37	0200	4495
0959	4495	888	0	32	0600	4254
0960	4254	888	0	65	0255	4107
0961	4107	888	0	37	0200	4662
0962	4662	888	0	60	83FB	4066
0963	4066	888	0	25	85FB	4120
0964	4120	888	0	05	4522	8920
0965	4522	888	0	65	85FB	4478
0966	4478	888	0	77	4478	4481
0967	4481	888	0	35	4533	4535
0968	4535	888	0	20	83FB	4339
0969	4339	888	0	60	0370	4722
0970	4722	888	0	25	0008	4126
0971	4126	888	0	35	4678	4130
0972	4130	888	0	37	0200	4735
0973	4735	888	0	60	0286	4288
0974	4288	888	0	25	85FB	4092
0975	4092	888	0	35	4494	4096
0976	4096	888	0	37	0200	4451
0977	4451	888	0	20	4703	4455
0978	4455	888	0	60	0281	4733
0979	4733	888	0	25	85FB	4287
0980	4287	888	0	35	4539	4491
0981	4491	888	0	77	4491	4694
0982	4694	888	0	25	84FB	4148
0983	4148	888	0	06	4651	4651
0984	4651	888	0	32	0400	4458
0985	4458	888	0	37	0200	4263
0986	4263	888	0	32	0600	4172
0987	4172	888	0	37	0200	4677
0988	4677	888	0	20	0008	4681
0989	4681	888	0	20	4183	4185
0990	4185	888	0	60	0365	4067
0991	4067	888	0	25	000C	4471
0992	4471	888	0	20	4123	4175
0993	4175	888	0	60	0250	4452
0994	0205	888	0	00	0000	0000
0995	83AG	888	0	06	4669	4669
0996	4669	888	0	63	4669	4372
0997	4372	888	0	60	0250	4652
0998	4652	888	0	65	0255	4307

0205  
PSUDX

LDA	R	
SHR	0300	
LDA	RL	
LDL		OTPT*
LDA	TEMP1	IF
LDX		UNDG*
STX	TEMP1	
CLX		
SHR	0400	
SHL	0200	
SHR	0600	
STX	0255	
SHL	0200	
STA	TEMP	
LDA	TEMP2	
LDX		UNDG*
STX	TEMP2	
ATL		
ERS#	HHHHH	H0000
BUF	TEMP	
STA	0370	
LDA	RL	
ERS#	00000	OHHHH
SHL	0200	
STA	0286	
LDA	TEMP2	
ERS#	00000	OHHHH
SHL	0200	
BUF#	BBBB0	000B3
STA	0281	
LDA	TEMP2	
ERS#	HHHHH	H0000
ATL		
LDA	TEMP1	
CLX		
SHR	0400	
SHL	0200	
SHR	0600	
SHL	0200	
BUF	RL	
BUF#	00080	80083
STA	0365	
LDA	RX	
BUF#	00008	80000
STA	0250	ALLX
CON	00000	00000
CLX		
ZAP		
STA	0250	
STX	0255	

P15.EDIT

THE ASSEMBLED INSTRUCTION IS EDITED AND  
SENT TO THE PRINTER AREA.  
FOR CONTROL OPERATIONS, HOWEVER, THIS PART  
IS SET TO BLANKS.

0999	4307	888	0	60	0281	4383		STA	0281	
1000	4383	888	0	65	0286	4488		STX	0286	
1001	4488	888	0	60	0365	4267		STA	0365	
1002	4267	888	0	65	0370	4452		STX	0370	ALLX
1003	4452	888	0	31	4655	4655	ALLX	CLL		
1004	4655	888	0	25	87FH	4609		LDA	FTAG	
1005	4609	888	0	82	4112	4312		TEQ	FIN	FLOW
1006	4112	888	0	25	8678	4266	FIN	LDA	R0009	
1007	4266	888	0	05	8677	4320		LDX	R0008	
1008	4320	888	0	60	0262	4664		STA	0262	
1009	4664	888	0	65	0267	4119		STX	0267	
1010	4119	888	0	25	8674	4323		LDA	R0005	
1011	4323	888	0	05	8673	4127		LDX	R0004	
1012	4127	888	0	60	0294	4296		STA	0294	
1013	4296	888	0	65	0299	4101		STX	0299	
1014	4101	888	0	25	8670	4105		LDA	R0001	
1015	4105	888	0	05	8669	4059		LDX	R0000	
1016	4059	888	0	60	0325	4327		STA	0325	
1017	4327	888	0	65	0330	4482		STX	0330	
1018	4482	888	0	25	8676	4486		LDA	R0007	
1019	4486	888	0	05	8675	4290		LDX	R0006	
1020	4290	888	0	60	0378	4330		STA	0378	
1021	4330	888	0	65	0383	4385		STX	0383	
1022	4385	888	0	25	8672	4739		LDA	R0003	
1023	4739	888	0	05	8671	4293		LDX	R0002	
1024	4293	888	0	60	0209	4311		STA	0209	
1025	4311	888	0	65	0214	4466		STX	0214	
1026	4466	888	0	25	86F8	4520		LDA	ERROR	
1027	4520	888	0	06	4523	4523		CLX		
1028	4523	888	0	62	4523	4527		ZUP		
1029	4527	888	0	37	0400	4284		SHL	0400	
1030	4284	888	0	20	81FG	4688		BUF	LINE	
1031	4688	888	0	20	4490	4292		BUF#	00000	B0000
1032	4292	888	0	60	0200	4102		STA	0200	
1033	4102	888	0	25	82AC	4506		LDA	LC	
1034	4506	888	0	70	4658	4511		ADD		-PR
1035	4658	888	0	99	9999	9951		CON	99999	99951
1036	4511	888	0	75	4114	4467	-PR	SUB#	99999	99950
1037	4467	888	0	60	82AC	4671		STA	LC	
1038	4671	888	0	11	0201	4189		PRN	0201	-PR1
1039	4512	888	0	60	82AC	4666	3PR	STA	LC	
1040	4666	888	0	11	0217	4189		PRN	0217	-PR1
1041	4190	888	0	67	3333	000A	4PR1	HLT	3333	RA
1042	4189	888	0	25	87FG	4493	-PR1	LDA	TAPE1	
1043	4493	888	0	70	4695	000A		ADD		RA
1044	4695	888	0	08	0000	4200		LIP1	0000	START
1045										
1046										
1047										
1048										

P16.FLOW CHART  
IF THE CONTROL OPERATION FLO  
YES:HAS APPEARED EARLIER, GO TO THE FLOW-  
CHARTING ROUTINE#X1.  
NO:  
P17. PRINT  
MOVE THE REMARKS TO THE PRINTER AREA FROM  
REGION R. TAKE ALL ERROR CONDITIONS THAT  
HAVE BEEN DETECTED AND PUT THEM ON THE LIST-  
ING. THERE IS ROOM FOR AT MOST 5 ERRORS.  
INTERROGATE THE PAGE-LINE COUNTER TO SEE IF  
A SKIP TO NEXT PAGE IS NECESSARY.  
FINALLY PRINT THE LINE, AND GET READY FOR  
THE NEXT LINE, GOING TONE1.

C. CONTROL OPS.  
C1. BRANCH TO OP  
G RA CONTAINS A TRANSFER TO CONTROL OP.  
G FROM STEP E9.

1049  
1050  
1051  
1052  
1053  
1054  
1055  
1056  
1057  
1058  
1059  
1060  
1061  
1062  
1063  
1064  
1065  
1066  
1067  
1068  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079  
1080  
1081  
1082  
1083  
1084  
1085  
1086  
1087  
1088  
1089  
1090  
1091  
1092  
1093  
1094  
1095  
1096  
1097  
1098

85AG	888	0	25	8709	4720
4720	888	0	60	86FH	83AG
86AG	888	0	25	4318	4170
4170	888	0	67	1212	4712
4712	888	0	60	87FH	83AG
81AH	888	0	25	82FG	4572
82AH	888	0	25	83FG	4572
84AH	888	0	25	8708	4572
4572	888	0	60	84FG	80AH
80AH	888	0	30	4128	4530
4128	888	0	30	4730	4226
4730	888	0	30	84FG	4676
4530	888	0	50	80FB	4484
4484	888	0	25	86FG	4138
4138	888	0	30	4690	4492
4492	888	0	82	4145	4345
4345	888	0	32	0200	4145
4145	888	0	60	89FC	80FB
80AG	888	2	02	0000	4319
81AG	888	2	02	0003	4319
4319	888	0	25	8711	4723
4723	888	0	30	4375	4727
4727	888	0	82	4180	4380
4380	888	0	35	4682	4684
4684	888	0	37	0400	4691
4180	888	0	07	0001	4691
4691	888	0	77	4691	4144
4144	888	0	20	4496	4348
4348	888	0	60	4450	4302
4302	888	0	25	0008	4706
4706	888	0	06	4259	4259
4259	888	0	32	0400	4116

HHH

FLO

NUM

ZON

ALF

1

CON

PSIGN

1

BLA

BLR

1

1

2

LDA	MH
STA	HTAG
LDA#	HHHHH
HLT	1212
STA	FTAG
LDA	MCN
LDA	MCZ
LDA	M
STA	MC
LDL	
LDL	
LDL	MC
STL	EXIT
LDA	IR
LDL#	00000
TEQ	1F
SHR	0200
STA	SIGN
LIR4	0000
LIR4	0003
LDA	CH
LDL#	00000
TEQ	1F
ERS#	00000
SHL	0400
IIR	0001
ATL	
BUF	BVAR1
STA	BVAR
LDA	RL
CLX	
SHR	0400

PSUDX

HHHHH

PSUDX

1F

1F

1F

CON

PSIGN

PROCA

BILD1

00000

1F

EXIT

1F

1F

00888

000HH

2F

2F

IF OP IS BLANK, GO TO#P15.  
CON:FOR CON,NUM,ZON,ALF, GO TONC2.  
BLR:FOR BLA,BLR GO TONC3.  
COR:FOR COR GO TONC4.  
EQU:FOR EQU GO TONC5.  
HHH:FOR HHH, SET MH INTO HTAG AND GO TO#P15.  
OFF:FOR OFF GO TONC6  
FLO:FOR FLO, SET FLOWCHARTING TAG ON AND GO TO  
#P15 ALSO.  
PAT:FOR PAT,PRINT THE AVAILABILITY TABLE AND  
GO TONE1.  
TYP:FOR TYP, HALT AND INSERT RA IN TYPE OF PROG.  
X GO TO#P15.  
ERR:IF AN ERROR OCCURS WHILE PROCESSING ONE OF  
THE ABOVE, NO ADDITIONAL ACTION TAKES PLACE  
AND WE GO TO#P15.  
END:FOR END, GO TO THE ENDING ROUTINE#Z1.

G OPERATOR SHOULD CLEAR A IF FLOWCHARTING  
G IS NOT DESIRED.

C2. PROCESS A  
USE ROUTINE L TO GET THE A ADDRESS,  
THEN USE THE IR FIELD TO INDICATE THE

SIGN AND GO TO#P14 TO ASSEMBLE THE INSTRU-  
TION.

C3. UPDATE AVAIL TABLE  
CHECK CH-FIELD FOR INCREMENT. IF BLANK,  
USE 1; ELSE USE CH MOD 100. FIND\* M,  
IF UNDEFINED, ERROR. IF C IS BLANK, SET  
C EQUAL TO M; ELSE FIND\* C. IF UNDEFINED,  
ERROR. FIND THE STARTING PLACE IN THE  
AVAILABILITY TABLE, AND KEEP RESERVING OR  
UNRESERVING ONE LOCATION AT A TIME  
UNTIL DONE. GO TONC5.



1099	4116	888	0	75	4518	4121		SUB#	00000	00001
1100	4121	888	0	60	84FB	4575		STA	TEMP1	1F
1101	4575	888	0	05	4177	4179	1	LDX	2F	FP2ER
1102	4179	888	1	08	0002	4132	FP2ER	LIR3	0002	FPERR
1103	4177	888	0	60	86FC	4131	2	STA	MLOC	
1104	4131	888	0	25	8710	4585		LDA	C	
1105	4585	888	0	30	4487	4389		LDL#	00000	88888
1106	4389	888	0	82	4692	4142		TEO		1F
1107	4692	888	0	26	4545	4545		CLA	3F	
1108	4142	888	1	08	0004	4745	1	LIR3	0004	
1109	4745	888	0	05	4647	4132		LDX	2F	FPERR
1110	4132	888	0	30	4134	8810	FPERR	LDL	PERR	FIND*
1111	4647	888	0	75	86FC	4545	2	SUB	MLOC	3F
1112	4545	888	0	60	85FB	4649	3	STA	TEMP2	
1113	4649	888	0	25	86FC	4153		LDA	MLOC	7F
1114	4153	888	0	30	000A	4507	7	LDL	RA	
1115	4507	888	0	85	4459	4686		MUL#	00000	0A005
1116	4686	888	0	60	83FB	4140		STA	TEMP	
1117	4140	888	0	26	4693	4693		CLA		
1118	4693	888	0	32	0400	4650		SHR	0400	
1119	4650	888	0	25	000C	4104		LDA	RX	
1120	4104	888	0	70	000A	4659		ADD	RA	
1121	4659	888	0	35	4711	4463		ERS#	00HHH	H0000
1122	4463	888	0	20	4315	000A		BUF		RA
1123	4315	888	0	08	0000	4370		LIR1	0000	
1124	4370	888	0	26	4173	4173		CLA		
1125	4173	888	0	75	83FB	4328		SUB	TEMP	
1126	4328	888	0	37	0300	4334		SHL	0300	
1127	4334	888	0	35	4136	4338		ERS#	00000	30000
1128	4338	888	0	75	4340	000A		SUB		RA
1129	4340	888	0	02	0000	4195		LIR	0000	
1130	4195	888	0	25	83FB	4099		LDA	TEMP	
1131	4099	888	0	37	0600	4108		SHL	0600	
1132	4108	888	0	35	4360	4162		ERS#	000H0	00000
1133	4162	888	0	20	4314	4316		BUF	1F	
1134								HHH		C
1135	4316	888	0	77	4316	8965		ATL		OF
1136	8965	888	2	00	8403	8403	0	JMP4	80000	
1137	8403	888	1	25	8409	8966	80000	LDA2	80006	2F
1138	8406	888	1	25	8413	8966	80003	LDA2	80010	2F
1139	8404	888	0	00	0000	0000	80001	CON	00000	00000
1140	8407	888	0	HH	HHHH	HHHH	80004	CON	HHHHH	HHHHH
1141	8966	888	2	05	8404	0008	2	LDX4	80001	RL
1142	4314	888	0	32	0000	8967	1	SHR	0000	7F
1143	8967	888	0	60	82FC	8968	7	STA	MASK	
1144	8968	888	2	30	8405	8969		LDL4	80002	-B2
1145	8969	888	0	29	8418	0008	-B2	LDA1	00001	RL
1146	8405	888	0	20	82FC	8971	80002	BUF	MASK	8F
1147	8408	888	0	35	82FC	8971	80005	ERS	MASK	8F
1148	8409	888	0	50	0000	0000	80006	CON	50000	00000

1149	8410	888	0	40	0000	0000	80007	CON	40000	00000
1150	8411	888	0	20	0000	0000	80008	CON	20000	00000
1151	8412	888	0	10	0000	0000	80009	CON	10000	00000
1152	8413	888	0	CH	HHHH	HHHH	80010	CON	CHHHH	HHHHH
1153	8414	888	0	8H	HHHH	HHHH	80011	CON	8HHHH	HHHHH
1154	8415	888	0	FH	HHHH	HHHH	80012	CON	FHHHH	HHHHH
1155	8416	888	0	GH	HHHH	HHHH	80013	CON	GHHHH	HHHHH
1156	8971	888	0	64	B418	8972	8	STA1	00001	
1157	8972	888	0	25	B5FB	8973		LDA	TEMP2	
1158	8973	888	0	75	B4FB	8974		SUB	TEMP1	
1159	8974	888	0	70	B975	8976		ADD		-B1
1160	8975	888	0	99	9999	9999		CON	99999	99999
1161	8977	888	0	60	B5FB	4450	8B1	STA	TEMP2	BVAR
1162	4496	888	0	0G	0000	8978	BVAR1	IIR1	0000	
1163	8978	888	0	70	B979	8969		ADD		-B2
1164	8979	888	0	99	9800	0000		CON	99980	00000
1165	8970	888	0	20	B980	000A	8B2	SUF		RA
1166	8980	888	0	08	0000	8981		LIR1	0000	
1167	8981	888	0	25	B2FC	8982		LDA	MASK	
1168	8982	888	0	30	000C	8983		LDL	RX	
1169	8983	888	0	32	0100	8984		SHR	0100	
1170	8984	888	0	82	B985	8967		TEQ		7B
1171	8985	888	1	07	0001	8986		IIR2	0001	
1172	8986	888	0	30	B967	8965		LDL	7B	0B
1173								HHH		H
1174	84AG	888	0	05	4718	4179	EQU	LDX	2F	FP2ER
1175	4718	888	0	60	B6FC	8976	2	STA	MLOC	-B1
1176	4134	888	0	30	B3AG	8736	PERR	LDL	PSUDX	ERR1*
1177	82AG	888	0	25	B3FC	4570	COR	LDA	CORE	
1178	4570	888	0	70	4772	4775		ADD#	00000	10000
1179	4775	888	0	06	4528	4528		CLX		
1180	4528	888	0	32	0400	4785		SHR	0400	
1181	4785	888	0	20	4687	4589		SUF#	00000	0B000
1182	4589	888	0	60	B6FC	4143		STA	MLOC	
1183	4143	888	0	05	4395	4179		LDX	2F	FP2ER
1184	4395	888	0	37	0400	4502	2	SHL	0400	
1185	4502	888	0	70	B3FC	4707		ADD	CORE	
1186	4707	888	0	05	000A	4161		LDX	RA	
1187	4161	888	0	70	4663	4516		ADD		-B3
1188	4663	888	0	99	9000	0000		CON	99900	00000
1189	4517	888	0	25	4169	4321	8B3	LDAN	00000	00005
1190	4321	888	0	05	4134	8760		LDX	PERR	ERR2*
1191	4516	888	0	65	B3FC	8976	-B3	STX	CORE	-B1
1192	8976	888	1	08	0000	4373	-B1	LIR3	0000	
1193	4373	888	0	05	4134	4336		LDX	PERR	FIND*
1194	4336	888	0	30	4538	8810		LDL		
1195	4538	888	1	00	B688	B688		JMP2	X0000	
1196	B688	888	0	25	B6FC	4097	X0000	LDA	MLOC	1F
1197	B689	888	0	25	B6FC	4097	X0001	LDA	MLOC	1F
1198	B690	888	0	00	B3AG	83AG	X0002	JMP	PSUDX	

C4. RESERVE CORE  
IF M IS UNDEFINED, OR THERE ISNT ENOUGH ROOM  
IN CORE THIS IS AN ERROR. OTHERWISE RESERVE  
THE SPACE IN CORE, AND GO TO C5.

C5. DEFINE ADDRESS  
FIND A (ROUTINE Q). IF DEFINED, OR IF A  
PAIR ADDRESS, THE A FIELD IS IN ERROR, ELSE  
IF NONBLANK DEFINE IT (ROUTINE D).  
GO TO MP15.

X. EXAMINE REMARKS FIELD  
G Cmpl\* PUTS INSTRUCTION IN RA INTO MUM CODE  
G MUML IS THE LOCATION OF LAST MUM INSTR.  
G Cmp\* PUTS WORD IN RL INTO MUM CODE  
G BUT IT ISNT REALLY AN INSTRUCTION  
G EXIT IS IN RX, IN BOTH CASES.  
THIS ROUTINE IS ENTERED ON EVERY CARD EXCEPT  
PAT AFTER FLO HAS APPEARED.  
THE PURPOSE IS TO SEND INFORMATION TO PASS 3  
FOR FLOWCHARTING. THIS INFORMATION IS  
TRANSMITTED AS A 'MADE-UP-MACHINE' OR MUM  
PSEUDOCODE. SPECIFICATIONS OF MUM GIVEN  
IN THE PASS 3 LISTING.  
G MOVE ALL REMARKS TO THE COMMENTS TAPE  
G FOR USE BY PASS 3.

1249	4383	888	0	99	9800	0000
1250	4343	888	0	60	88AC	4297
1251	4297	888	0	05	4699	4301
1252	4301	888	0	30	4553	8919
1253	4553	888	0	C6	3400	4699
1254	4699	888	0	H2	0700	4342
1255	4305	888	0	25	8669	4109
1256	4109	888	0	35	4361	4313
1257	4313	888	0	60	8669	4667
1258	4667	888	0	25	8670	4521
1259	4521	888	0	35	4773	4326
1260	4326	888	0	20	4728	4580
1261	4580	888	0	60	8670	0008
1262	4312	888	1	08	0007	4515
1263	4515	888	0	25	8670	4519
1264	4519	888	0	06	4124	4124
1265	4124	888	0	65	88FH	4178
1266	4178	888	0	32	0500	4186
1267	4186	888	0	77	4186	4789
1268	4789	888	0	25	8669	4543
1269	4543	888	0	35	4595	4497
1270	4497	888	0	20	0008	4501
1271	4501	888	0	60	80AB	4705
1272	4705	888	0	30	4157	4309
1273	4309	888	0	82	4362	4562
1274	4562	888	0	30	4514	4716
1275	4716	888	0	82	4719	4369
1276	4719	888	0	60	88FH	4324
1277	4324	888	0	30	4362	4505
1278	4369	888	0	30	4721	4524
1279	4524	888	0	82	4577	4777
1280	4577	888	0	30	4112	4505
1281	4777	888	0	30	4379	4531
1282	4531	888	0	82	4534	4734
1283	4734	888	0	30	4386	4738
1284	4738	888	0	82	4141	4341
1285	4141	888	0	05	4534	4736
1286	4341	888	0	35	4743	4795
1287	4795	888	0	30	4697	4149
1288	4149	888	0	82	4152	4352
1289	4352	888	0	35	4504	4356
1290	4356	888	0	30	4308	4560
1291	4560	888	0	82	4513	4713
1292	4713	888	0	35	4715	4117
1293	4117	888	0	30	4569	4171
1294	4171	888	0	82	4174	4374
1295	4174	888	0	25	80AB	4378
1296	4378	888	0	35	4780	4532
1297	4532	888	0	37	0300	4188
1298	4513	888	0	25	80AB	4317

&COM

2

BOK

FLOW

1

1

1

1

CON	99980	00000
STA	COMI	
LDX	2F	
LDL		TSUB*
TBL	COMTS	2F
TWR	OTAP3	-COM
LDA	R0000	
ERS#	00000	HHHHH
STA	R0000	
LDA	R0001	
ERS#	00000	HHHHH
BUF#	88888	00000
STA	R0001	RL
LIR3	0007	
LDA	R0001	
CLX		
STX	RTAG	
SHR	0500	
ATL		
LDA	R0000	
ERS#	HHHHH	00000
BUF	RL	
STA	DK	
LDL#	00000	88888
TEQ	S5	
LDL#	03000	87888
TEQ		1F
STA	RTAG	
LDL	S5	BOK
LDL#	01000	87888
TEQ		1F
LDL	FIN	BOK
LDL#	01211	83649
TEQ	S6	
LDL#	03112	83123
TEQ		1F
LDX	S6	COMP*
ERS#	HHHHH	HHHHH
LDL#	00100	80AB8
TEQ	S4	
ERS#	HHHHH	HHHHH
LDL#	00010	80AB8
TEQ	1F	
ERS#	HHHHH	HHHHH
LDL#	00001	8000A
TEQ		S3
LDA	DK	
ERS#	00000	00HH0
SHL	0300	2F
LDA	DK	

G BOK: BLANK OUT COLS 32-35 AND GO TO RL.

X1. WHAT DK FIELD  
COLUMNS 32-35 ARE THE DOCUMENTATION KEY OR DK  
FIELD, AND THEY CONTROL THE FLOWCHARTING OPER  
ATION.

IF THE DK FIELD IS BLANK, GO TONX2.

G IF IT IS G, BLANK IT OUT AND GO TONP17.

G IS USED TO PUT REMARKS ON THE ASSEMBLY  
LISTING.

COD: IF IT IS CODI, THIS IS THE BEGINNING OF THE  
WORDS CODING DETAILS. TONX3.

TAB: IF IT IS TABL, THIS IS THE BEGINNING OF THE  
WORDS TABLE OF CONTENTS. COMPIL THE DK  
FIELD AS AN 03 OP IN MUM CODE. THIS SPECIAL  
CASE IS EXAMINED BY PASS 3, THEN GO TONX3.

K. IF IT IS THE FORM K. THIS INDICATES A NEW  
SECTION WITH KEY K. GO TONX6.

KN. IF IT IS OF THE FORM KN. OR KNN. IT IS A NEW  
SUBSECTION NAME. CHECK THAT THEY ARE NUM-  
BERED SEQUENTIALLY AND IF NO ERROR GO TONX4.  
OTHRANYTHING ELSE IS A CONDITION NAME. TONX5.

1299	4317	888	0	35	4769	4371
1300	4371	888	0	37	0200	4188
1301	4188	888	0	70	000A	4193
1302	4193	888	0	30	4146	4748
1303	4748	888	0	87	4701	4151
1304	4151	888	0	30	4362	8736
1305	4362	888	0	08	0000	4367
1306	4367	888	0	29	8670	4574
1307	4574	888	0	35	4526	4578
1308	4578	888	0	75	000A	4783
1309	4783	888	0	77	4783	4586
1310	4586	888	0	29	8670	4541
1311	4541	888	0	35	4393	4346
1312	4346	888	0	C1	4346	4349
1313	4349	888	0	70	4351	4704
1314	4704	888	0	35	0008	4508
1315	4508	888	0	77	4508	4561
1316	4561	888	0	29	8669	4166
1317	4166	888	0	70	4568	4571
1318	4571	888	0	35	0008	4726
1319	4726	888	0	31	4579	4579
1320	4579	888	0	82	4732	4182
1321	4732	888	0	06	0002	4786
1322	4786	888	0	70	4388	4367
1323	4388	888	0	99	9990	0000
1324	4368	888	0	00	4534	4534
1325	4182	888	0	30	4184	4137
1326	4137	888	0	20	0008	4741
1327	4741	888	0	85	000A	4770
1328	4770	888	0	35	4774	4176
1329	4176	888	0	37	0600	4337
1330	4337	888	0	77	4337	4390
1331	4390	888	0	70	4542	4546
1332	4546	888	0	60	80AC	4100
1333	4100	888	0	25	4552	4154
1334	4154	888	0	75	0008	4509
1335	4509	888	0	70	4542	4746
1336	4746	888	0	60	81AC	4300
1337	4542	888	0	32	0000	0008
1338	4300	888	0	29	8670	4155
1339	4155	888	0	09	8672	4760
1340	4760	888	0	30	4762	80AC
1341	4762	888	0	35	4366	4768
1342	4768	888	0	65	83FB	4376
1343	4376	888	0	30	4778	81AC
1344	4778	888	0	32	0100	4384
1345	4384	888	0	69	8670	4590
1346	4590	888	0	29	8669	4196
1347	4196	888	0	09	8671	4551
1348	4551	888	0	30	4753	80AC

2

S5  
-NON

8NON  
1

1  
2

ERS#	00000	00H00
SHL	0200	2F
ADD	RA	
LDL	N	
TGR	S2	
LDL	S5	ERR1*
LIR1	0000	-NO#
LDA1	R0001	
ERS#	88888	88888
SUB	RA	
ATL		
LDA1	R0001	
ERS#	66666	66666
MTX		
ADD#	33333	33333
ERS	RL	
ATL		
LDA1	R0000	
ADD#	33333	33333
ERS	RL	
CLL		
TEQ		1F
LIR1	0002	
ADD		-NO#
CON	99999	00000
JMP	S6	
LDL#	11111	11111
BUF	RL	
MUL	RA	
ERS#	00000	0000H
SHL	0600	
ATL		
ADD	1F	
STA	SHR1	
LDA#	00090	00000
SUB	RL	
ADD	1F	
STA	SHR2	2F
SHR	0000	RL
LDA1	R0001	
LDX1	R0003	
LDL		SHR1
ERS#	HHHHH	HHHH8
STX	TEMP	
LDL		SHR2
SHR	0100	
STX1	R0001	
LDA1	R0000	
LDX1	R0002	
LDL		SHR1

X2. SCAN FOR #  
LOOK THROUGH ALL REMARKS FOR A NUMBER SIGN.

GATHER TOGETHER THE SHARACTERS FOLLOWING IT,  
UP UNTIL THE NEXT CHARACTER WITH UNDIGITS.  
THE PRINTING CHARACTERS + AND / ARE NOT  
DELIMITERS; THE OTHERS ARE.) THIS FORMS THE  
BRANCH WORD. IF NO CONDITION PRECEDED,  
COMPILE AN 09 OP. IF THE BRANCH WORD REFERS  
TO THIS CHART, PUT M AND C INTO THE LAST  
COMPILES INSTRUCTION. PUT A RECORD FOR THIS  
ENTRY AND N IN THE STOP TABLE AS THE LAST  
BRANCH TO M. OTHERWISE, COMPILE THE BRANCH  
WORD INTO THE MUM CODE.



1349	4753	888	0	35	4357	4709
1350	4709	888	0	30	4761	81AC
1351	4761	888	0	32	0100	4717
1352	4717	888	0	69	8669	4576
1353	4576	888	0	30	4779	80AC
1354	4779	888	0	35	4584	4537
1355	4537	888	0	77	4537	4790
1356	4790	888	0	25	83FB	4744
1357	4744	888	0	06	4147	4147
1358	4147	888	0	32	0500	4355
1359	4355	888	0	20	0008	4159
1360	4159	888	0	60	83FB	4163
1361	4163	888	0	25	87AC	4167
1362	4167	888	0	60	82AB	4771
1363	4771	888	2	25	5201	4354
1364	4354	888	0	70	4556	4363
1365	4556	888	0	98	0000	0000
1366	4363	888	0	25	4566	4776
1367	4776	888	0	05	4364	4332
1368	4364	888	0	30	83FB	4731
1369	4731	888	0	05	4784	4737
1370	4784	888	0	88	8880	0000
1371	4737	888	0	25	4191	4593
1372	4191	888	1	00	0000	0000
1373	4593	888	0	70	0008	4198
1374	4198	888	0	82	4751	4752
1375	4752	888	0	25	0008	4756
1376	4756	888	0	32	0100	4563
1377	4563	888	0	35	4165	4567
1378	4567	888	0	77	4567	4737
1379	4751	888	0	25	000C	4555
1380	4555	888	0	35	4557	4359
1381	4359	888	0	20	0008	4763
1382	4763	888	0	77	4763	4766
1383	4766	888	0	25	83FB	4181
1384	4181	888	0	50	83FB	4187
1385	4187	888	0	35	4391	4793
1386	4793	888	0	30	89AC	4347
1387	4347	888	0	82	4500	4700
1388	4500	888	0	25	83FB	4554
1389	4554	888	0	35	4757	4559
1390	4559	888	0	30	4714	4767
1391	4767	888	0	82	4381	4581
1392	4381	888	0	25	4387	4591
1393	4387	888	0	00	0000	000H
1394	4581	888	0	25	83FB	4587
1395	4587	888	0	35	4791	4194
1396	4194	888	0	30	4396	4398
1397	4398	888	0	82	4754	4700
1398	4754	888	0	25	4708	4591

ERS#	HHHHH	HHHH0
LDL		SHR2
SHR	0100	
STX1	R0000	
LDL		SHR1
ERS#	HHHHH	00000
ATL		
LDA	TEMP	
CLX		
SHR	0500	
BUF	RL	
STA	TEMP	
LDA	MUML	
STA	RB4	
LOA4	W0001	
ADD		-#
CON	98000	00000
LDA#	09000	00000
LDX	&#	CMPL*
LDL	TEMP	
LDX		1F
CON	BBBBB	00000
LDA		8F
CON1	00000	00000
ADD	RL	
TEQ	2F	
LDA	RL	
SHR	0100	
ERS#	0HHHH	0HHHH
ATL		1B
LDA	RX	
ERS#	00000	HHHHH
BUF	RL	
ATL		2F
LDA	TEMP	
STL	TEMP	
ERS#	H0000	H0000
LDL	KEY	
TEQ		2F
LDA	TEMP	
ERS#	HHH0H	HHH00
LDL#	00000	BBB00
TEQ		3F
LDA		4F
CON	00000	0000H
LDA	TEMP	
ERS#	HH0HH	HH000
LDL#	00000	BB000
TEQ		2F
LDA		4F

1399	4708	888	0	00	0000	00HH
1400	4591	888	0	35	83FB	4596
1401	4596	888	0	37	0400	4755
1402	4755	888	0	70	000A	4164
1403	4164	888	0	60	82AB	4781
1404	4781	888	0	77	4781	4787
1405	4787	888	0	25	4742	4394
1406	4394	888	0	70	4796	4549
1407	4549	888	0	60	4742	4594
1408	4594	888	0	70	0008	4749
1409	4749	888	0	05	87AC	4158
1410	4158	888	0	65	83AB	4564
1411	4564	888	3	70	5201	4358
1412	4358	888	3	60	5201	4558
1413	4558	888	0	25	4146	4598
1414	4598	888	0	70	4742	4547
1415	4547	888	2	60	5001	4534
1416	4700	888	0	30	83FB	4758
1417	4758	888	0	05	4534	4736
1418	4534	888	0	30	4588	4192
1419	4192	888	0	25	8670	4747
1420	4747	888	0	82	4150	4350
1421	4150	888	0	25	8672	4759
1422	4759	888	0	82	4764	4350
1423	4764	888	0	25	8674	4382
1424	4382	888	0	82	4788	4350
1425	4788	888	0	25	8676	4392
1426	4392	888	0	82	4197	4350
1427	4197	888	0	25	8678	4365
1428	4365	888	0	82	4582	4350
1429	4350	888	0	30	4765	4740
1430	4765	888	0	25	4782	4592
1431	4782	888	0	00	8678	8669
1432	4592	888	0	80	0989	4582
1433	4582	888	0	25	88FH	4792
1434	4792	888	0	31	4397	4397
1435	4397	888	0	82	4112	4189
1436	0989	888	0	00	0000	0000
1437	0991	888	0	00	0000	0000
1438	0993	888	0	00	0000	0000
1439	0995	888	0	00	0000	0000
1440	0997	888	0	00	0000	0000
1441	0990	888	0	88	8888	8888
1442	0992	888	0	88	8888	8888
1443	0994	888	0	88	8888	8888
1444	0996	888	0	88	8888	8888
1445	0998	888	0	88	8888	8888
1446						
1447	4701	888	0	60	4146	0548
1448	0548	888	0	70	0550	0553

4	CON	00000	000HH
	ERS	TEMP	
	SHL	0400	
	ADD	RA	
	STA	RB4	
	ATL		
	LDA	SERAL	
	ADD#	00000	00001
	STA	SERAL	
	ADD	RL	
	LDX	MUML	
	STX	RB5	
	ADD5	W0001	
	STA5	W0001	
	LDA	N	
	ADD	SERAL	
	STA4	STOPT	S6
2	LDL	TEMP	
	LDX	S6	COMP#
S6	LDL#	88888	88888
	LDA	R0001	
	TEQ		1F
	LDA	R0003	
	TEQ		1F
	LDA	R0005	
	TEQ		1F
	LDA	R0007	
	TEQ		1F
	LDA	R0009	
	TEQ	2F	1F
1	LDL		COMT#
	LDA		8F
	JMP	R0009	R0000
8	TDC	Z0000	2F
2	LDA	RTAG	
	CLL		
	TEQ	FIN	-PRI
Z0000	CON	00000	00000
Z0002	CON	00000	00000
Z0004	CON	00000	00000
Z0006	CON	00000	00000
Z0008	CON	00000	00000
Z0001	CON	88888	88888
Z0003	CON	88888	88888
Z0005	CON	88888	88888
Z0007	CON	88888	88888
Z0009	CON	88888	88888
	HHH		
S2	STA	N	
	ADD#	01000	00000

X3. TRANSFER REMARKS  
IF THE REMARKS AREN'T ALL BLANK, COPY THEM  
ONTO THE COMMENTS TAPE 7. GO TONP17 UNLESS  
DK FIELD WAS X, IN WHICH CASE WE GO TO  
E1 DIRECTLY.

X4. COMPILE 01 OP  
COMPILE AN 01 OP FOLLOWED BY THE LINE NUMBER.

1449	0553	888	0	05	0555	4332	LDX		CMPL*
1450	0555	888	0	30	B1FG	0559	LDL	LINE	
1451	0559	888	0	05	0561	4736	LDX		COMP*
1452	0561	888	0	30	0563	4740	LDL		CONT*
1453	0563	888	0	25	B6AC	0767	LDA	MUMI	
1454	0767	888	0	60	B2AB	0571	STA	RB4	
1455	0571	888	2	07	0006	0775	IIR4	0006	
1456	0775	888	0	60	B6AC	0579	STA	MUMI	
1457	0579	888	0	25	0581	0583	LDA		8F
1458	0581	888	0	00	B670	8669	JMP	R0001	R0000
1459	0583	888	2	88	5194	0599	TCD4	W9994	
1460	0599	888	0	70	0401	0404	ADD#	00000	20002
1461	0404	888	2	88	5196	0420	TCD4	W9996	
1462	0420	888	0	70	0422	0425	ADD#	00000	20002
1463	0425	888	2	88	5198	4112	TCD4	W9998	FIN
1464	4374	888	0	30	0576	4505	LDL		BDK
1465	0576	888	0	25	B670	0580	LDA	R0001	
1466	0580	888	0	35	0582	0584	ERS#	00000	HHHHH
1467	0584	888	0	30	0586	0588	LDL#	00000	BBBBB
1468	0588	888	0	82	0591	0791	TEQ	1F	
1469	0791	888	0	25	B7AC	0595	LDA	MUML	
1470	0595	888	0	60	B2AB	0799	STA	RB4	
- 1471	0799	888	2	25	5201	0403	LDA4	W0001	
1472	0403	888	0	70	0405	0408	ADD#	01000	00000
1473	0408	888	2	60	5201	0603	STA4	W0001	
1474	0603	888	0	70	0605	0608	ADD		-FLO
1475	0605	888	0	97	0000	0000	CON	97000	00000
1476	0608	888	0	25	0410	0412	LDA		2F
1477	0410	888	0	06	0000	0000	CON	06000	00000
- 1478	0609	888	0	25	0411	0412	LDA		2F
1479	0411	888	0	05	0000	0000	CON	05000	00000
1480	0591	888	0	25	0593	0412	LDA		2F
1481	0593	888	0	08	0000	0000	CON	08000	00000
1482	0412	888	0	05	0414	4332	LDX		CMPL*
1483	0414	888	0	30	B0AB	0418	LDL	DK	
1484	0418	888	0	05	4362	4736	LDX	S5	COMP*
1485	4152	888	0	05	0554	0556	LDX#	03000	00000
1486	0556	888	0	30	0558	0560	LDL		TERM*
1487	0558	888	0	25	B0AB	0562	LDA	DK	
1488	0562	888	0	37	0100	0566	SHL	0100	
1489	0566	888	0	35	0768	0570	ERS#	H0000	H0000
1490	0570	888	0	60	B9AC	0574	STA	KEY	
1491	0574	888	0	31	0577	0577	CLL		
1492	0577	888	0	08	0000	0780	LIR1	0000	-CLR
1493	0780	888	0	54	5001	0803	STL1	STOPT	
1494	0803	888	0	06	0002	0407	IIR1	0002	
1495	0407	888	0	70	0409	0780	ADD		-CLR
1496	0409	888	0	99	9800	0000	CON	99980	00000
1497	0781	888	0	50	B6AC	0585	STL	MUMI	
1498	0585	888	0	50	B8AC	0589	STL	COMI	

AND TRANSFER THE SUBSECTION NAME, COLUMNS  
32-60, TO THE MUM CODE AREA AND THE COMMENTS  
TAPE ALSO. TONP17.

X5. COMPILE CONDITION

BLANK OUT THE DK FIELD. IF COLS 36-40 ARE  
BLANK THIS INDICATES A BRANCH TO THE NEXT  
SECTION SO AN 08 OP IS SELECTED. OTHERWISE  
THE LAST OP COMPILED IS INCREASED BY 1.  
IF IT WAS AN 01, SELECT OP 06 ELSE SELECT  
OP 05. FINALLY COMPILE THE SELECTED OP  
FOLLOWED BY THE CONDITION NAME. GO TONX2  
TO SCAN THE REST OF THE REMARKS.

X6. FINISH PREV SECTION

COMPILE 03 OP AND THEN PUT OUT A  
SENTINEL ON THE COMMENTS TAPE. WRITE THE  
STOP TABLE FOLLOWED BY ALL THE MUM CODE  
ON THE CONTROL TAPE 6. THERE IS ROOM FOR  
ABOUT 1500 LINES OF MUM CODE.

X7. INITIALIZE

RECORD THE NEW KEY LETTER SKIP TO THE NEXT  
PAGE ON THE ASSEMBLY LISTING.  
WRITE THIS LINE ON THE COMMENTS TAPE AND  
RETURN TONP17.



1499	0589	888	0	50	4742	0594
1500	0594	888	0	50	4146	0598
1501	0598	888	0	30	0400	0402
1502	0400	888	0	30	4112	4740
1503	0402	888	0	50	0804	0406
1504	0406	888	0	25	0808	0610
1505	0610	888	0	75	B2AC	0415
1506	0415	888	0	31	0618	0618
1507	0618	888	0	50	B2AC	0622
1508	0622	888	0	37	0400	0429
1509	0429	888	0	30	0431	0433
1510	0433	888	0	87	0436	0636
1511	0436	888	0	70	0438	0441
1512	0441	888	0	20	0443	0636
1513	0443	888	0	00	0040	0000
1514	0636	888	0	70	0638	000A
1515	0638	888	0	16	0000	0804
1516	0805	888	0	67	3333	000A
1517	0560	888	0	50	B0FB	0564
1518	0564	888	0	31	0967	0967
1519	0967	888	0	25	B6AC	0771
1520	0771	888	0	82	B0FB	0774
1521	0774	888	0	30	000C	0778
1522	0778	888	0	05	0980	4736
1523	0980	888	0	25	B8AC	0784
1524	0784	888	0	30	0786	0788
1525	0788	888	0	70	0590	000A
1526	0590	888	0	50	3401	3003
1527	3003	888	0	05	3005	0607
1528	0607	888	0	30	0809	8919
1529	0809	888	0	C6	3400	3005
1530	3005	888	0	H2	0700	0822
1531	0822	888	0	08	0000	0625
1532	0532	888	0	06	0200	0536
1533	0536	888	0	30	B6AC	0540
1534	0540	888	0	87	0543	0625
1535	0625	888	0	05	0427	0629
1536	0629	888	0	30	0631	8919
1537	0631	888	0	CF	5000	0427
1538	0427	888	0	H2	0600	0532
1539	0543	888	0	25	0545	0547
1540	0547	888	0	64	5199	0601
1541	0601	888	0	05	3203	3205
1542	3205	888	0	30	0807	8919
1543	0807	888	0	CF	5000	3203
1544	3203	888	0	H2	0600	B0FB
1545	0745	888	0	G2	0300	0762
1546	0762	888	0	C7	3167	0565
1547	3167	888	0	67	4444	0745
1548	0565	888	0	25	4223	0975

PAGE\*

1

&SKIP  
TERM\*

2

1

4

2

3

2

BOP

1

STL	SERIAL
STL	N
LDL	
LDL	FIN
STL	-SKIP
LDA#	00000
SUB	LC
CLL	
STL	LC
SHL	0400
LDL#	00004
TGR	
ADD#	00001
BUF	
CON	00004
ADD	
PFD	0000
HLT	3333
STL	EXIT
CLL	
LDA	MUMI
TEQ	EXIT
LDL	RX
LDX	
LDA	COMI
LDL#	99999
ADD	
STL	CMTS1
LDX	2F
LDL	
TBL	COMTS
TWR	OTAP3
LIR1	0000
IIR1	0200
LDL	MUMI
TGR	3F
LDX	2F
LDL	
TBL1	W9800
TWR	OTAP2
LDA#	99999
STA1	W9999
LDX	2F
LDL	
TBL1	W9800
TWR	OTAP2
TRD	ITAP1
TBT	
HLT	4444
LDA	TCON1

PAGE\*

COMT\*

00066

90000

1F

00000

1F

00000

RA

-SKIP

RA

COMP\*

99999

RA

TSUB\*

2F

4F

4F

TSUB\*

2F

1B

99999

TSUB\*

2F

EXIT

1F

BOP

G SKIP TO BEGINNING OF PAGE SUBROUTINE

G TERMINATE SECTION SUBROUTINE.

G RL IS THE EXIT; RX IS THE 03 OR 04 TO COMPILE

G THIS SUBROUTINE DOES WHAT IS DESCRIBED

G UNDER SUBSECTION X6.

B. BEGINNING OF ASSEMBLY

B1. CHECK INPUT TAPE

HOLD IF INPUT TAPE ISNT READY. HALT AND RETURN

TO#B1.

1549	0975	888	0	60	B8FG	0779
1550	0779	888	0	25	0745	0747
1551	0747	888	0	60	B9FG	0551
1552	0551	888	0	05	0753	0755
1553	0755	888	0	30	000C	B919
1554	0753	888	0	G2	0300	0770
1555	0770	888	0	25	4624	0776
1556	0776	888	0	60	B8FG	3180
1557						
1558						
1559						
1560	3180	888	0	30	0782	0984
1561	0782	888	1	00	0000	0001
1562	0984	888	0	50	B1FG	0988
1563	0988	888	0	31	3191	3191
1564	3191	888	0	50	B7FG	0795
1565	B9AH	888	0	08	0999	0671
1566	0671	888	0	31	0474	0474
1567	0474	888	0	29	1000	0602
1568	0602	888	0	70	0604	3007
1569	0604	888	0	12	0000	0000
1570	3007	888	0	54	1000	3008
1571	3008	888	0	0G	9999	0612
1572	0612	888	0	82	0795	0474
1573	0795	888	0	50	B3FC	3199
1574	3199	888	0	50	B4FC	3603
1575	3603	888	0	50	B7FH	3207
1576	3207	888	0	50	B5AC	0611
1577	0611	888	0	50	B6AC	0615
1578	0615	888	0	50	B2AC	0419
1579	0419	888	0	50	B3AC	0423
1580	0423	888	0	08	0000	0626
1581	0626	888	0	54	B649	0831
1582	0831	888	0	0G	0001	0435
1583	0435	888	0	70	0437	0626
1584	0437	888	0	99	9980	0000
1585	0627	888	0	25	0829	3031
1586	0829	888	0	00	B616	B417
1587	3031	888	0	B0	7800	0446
1588	0446	888	0	B8	4800	0461
1589	0461	888	0	30	0463	0465
1590	0465	888	0	50	B418	0469
1591	0469	888	0	08	0001	0472
1592	0472	888	0	30	0674	0676
1593	0674	888	0	GG	GGGG	9999
1594	0676	888	0	54	B418	0481
1595	0481	888	0	0G	0001	0485
1596	0485	888	0	70	0487	0676
1597	0487	888	0	99	9800	0000
1598	0677	888	0	30	0479	0681

	STA	TCONT	
	LDA	BOP	
	STA	LTAPE	
	LDX	1F	
	LDL	RX	TSUB4
1	TRD	ITAP1	
	LDA	TCON2	
	STA	TCONT	
	LDL		1F
	CON1	00000	00001
1	STL	LINE	
	CLL		
	STL	TAPE1	1F
BOP1	LIR1	0999	
	CLL	2F	
2	LDA1	STAB	
	ADD		-BOPR
	CON	12000	00000
-BOPR	STL1	STAB	8BOPR
8BOPR	IIR1	9999	
	TEQ	1F	2B
1	STL	CORE	
	STL	BLANK	
	STL	FTAG	
	STL	ACCUM	
	STL	MUMI	
	STL	LC	
	STL	LINE0	
	LIR1	0000	-BP
-BP	STL1	10000	
	IIR1	0001	
	ADD		-BP
	CON	99998	00000
8BP	LDA		8F
	JMP	D0199	00000
8	TDC	Y0000	
	TCD	70000	
	LDL#	BGGGG	99999
	STL	D0001	
	LIR1	0001	
	LDL		-BP1
	CON	GGGGG	99999
-BP1	STL1	D0001	
	IIR1	0001	
	ADD		-BP1
	CON	99980	00000
8BP1	LDL#	00000	00888

G01  
B2. READ BLOCK  
READ IN FIRST BLOCK INTO INPUT BUFFER

UNLOAD FIRST TAPE BUFFER AND INITIATE  
READING SECOND BLOCK. THE INPUT TAPE IS  
ALWAYS READING ONE BLOCK AHEAD. THERE MUST  
THEREFORE BE AN EXTRA HASH BLOCK AFTER THE  
ENDING SENTINEL.  
EACH TAPE BLOCK CONTAINS 10 LINES.

83. INITIALIZE

G CLEAR SYMBOL TABLE IN MULTIPLE ASSEMBLY.

SET LOWER CORE AVAILABLE  
SET BLANK ADDRESS UNDEFINED  
SET FLO MODE OFF

SET LINE COUNTERS TO ZERO

SET FORWARD AND BACKWARD LOCAL TABLES  
(I AND J TABLES) TO UNDEFINED.

SET DRUM STATUS SO THAT 0001 TO 4999  
ARE AVAILABLE

SET HHH BLANK.

1599	0681	888	0	50	86FH	0685
1600	0685	888	0	30	4056	0508
1601	0508	888	0	50	4439	0541
1602	0541	888	0	30	4201	0953
1603	0953	888	0	50	4200	0802
1604	0802	888	0	25	4189	0641
1605	0641	888	0	60	8901	0445
1606	0445	888	0	26	8902	8902
1607						
1608	87AG	888	1	08	0002	0669
1609	0669	888	0	05	0871	0673
1610	0673	888	0	30	0675	8810
1611	0675	888	0	67	000A	0871
1612	0871	888	0	20	0873	0875
1613	0875	888	0	05	0877	0679
1614	0679	888	0	30	0881	8900
1615	0881	888	0	25	85AC	0687
1616	0687	888	0	60	86FB	0491
1617	0491	888	0	25	0493	0495
1618	0495	888	0	60	4200	0502
1619	0502	888	0	25	83AG	0641
1620	0873	888	0	67	HHHH	0000
1621	0493	888	0	30	0695	0402
1622	0695	888	0	30	0497	0402
1623	0497	888	0	05	0499	0501
1624	0501	888	0	30	0503	0560
1625	0503	888	0	67	89AH	0703
1626	0703	888	0	F2	0500	0500
1627	0500	888	0	31	0903	0903
1628	0903	888	0	25	87FH	0507
1629	0507	888	0	82	0510	0710
1630	0710	888	0	F2	0600	0600
1631	0600	888	0	F2	0700	0700
1632	0700	888	0	G2	0400	0517
1633	0517	888	0	F6	8000	8000
1634	0510	888	0	G2	0500	0527
1635	0527	888	0	C7	0510	0530
1636	0530	888	0	F6	7800	7801
1637	0877	888	0	00	0000	7905
1638	83AH	888	0	30	0670	0402
1639	0670	888	0	06	3073	3073
1640	3073	888	0	63	3073	0476
1641	0476	888	0	60	0200	3002
1642	3002	888	0	65	0223	0825
1643	0825	888	0	60	0262	0664
1644	0664	888	0	65	0267	0869
1645	0869	888	0	60	0294	0496
1646	0496	888	0	65	0299	0701
1647	0701	888	0	60	0303	0505
1648	0505	888	0	65	0308	0910

	STL	HTAG	
	LDL	ONSW	
	STL	SWICH	
	LDL	STRT	
	STL	START	
	LDA	-PR1	WRITE
WRITE	STA	-OEX	
	CLA	&OEX	
END	LIRJ	0002	
	LDX	2F	
	LDL		FIND*
	HLT	RA	2F
2	BUF	1F	
	LDX	2F	
	LDL		OTPT*
	LDA	ACCUM	
	STA	ERROR	
	LDA	3F	
	STA	START	
	LDA	PSUDX	WRITE
1	HLT	HHHH	0000
3	LDL		PAGE*
	LDL		PAGE*
	LDX#	04000	00000
	LDL		TERM*
	HLT	BOP1	
	TRW	OTAP1	
	CLL		
	LDA	FTAG	
	TEQ	1F	
	TRW	OTAP2	
	TRW	OTAP3	
	TRD	0400	
	TBU	8000	B000
1	TRD	OTAP1	
	TBT	1B	
	TBU	Y0000	Y0001
2	JMP	0000	Y0105
PAT	LDL		PAGE*
	CLX		
	ZAP		
	STA	0200	
	STX	0223	
	STA	0262	
	STX	0267	
	STA	0294	
	STX	0299	
	STA	0303	
	STX	0308	

84. OUTPUT GETS LOADER  
WRITE LOADING ROUTINE ON OUTPUT TAPE.  
NEITHER TAPE IS EVER REWOUND BY THE PROGRAM.  
X WE ARE NOW READY TO TAKE OFF, GOING TOW#1.  
Z. ENDING OF ASSEMBLY.  
Z1. FIND\* M.  
FIND M. IF UNDEFINED, HALT AND THE OPERATOR  
IS SUPPOSED TO FILL RA WITH THE RIGHT THING.  
Z2. ASSEMBLE TRANSFER  
ASSEMBLE HLT HHHH MLOC INTO LOCATION 0105  
WHICH WILL CAUSE THE LOADING TO STOP WITH  
THIS INSTRUCTION.  
Z3. CLEAN OUTPUT BUFFER.  
WRITE THE LAST BUFFER LOAD ON THE OUTPUT  
TAPE. PRINT THE END LINE AND THE ERROR  
INDICATION ON THIS LINE IS BLANK IF AND ONLY  
IF NO ERRORS OCCURRED DURING ASSEMBLY.  
Z4. EJECT PAPER  
SKIP THE PRINTER PAPER ABOUT 2 PAGES AHEAD.  
Z5. FINISH FLO  
FINISH PROCESSING THE LAST SECTION OF FLOW-  
CHART, IF ANY (SEE X6, EXCEPT COMPILE  
04 INSTEAD OF 03 OP).  
Z6. HALT  
HALT THE COMPUTER, PASS 2 IS FINISHED.  
Z7. FLOWCHARTING  
NO. IF NOT FLOWCHARTING, #LOAD THE ASSEMBLED  
YES: PROGRAM. IF FLOWCHARTING, GO ON TOW#PASS3.

1649	0910	888	0	60	0325	0727
1650	0727	888	0	65	0330	0732
1651	0732	888	0	60	0334	0736
1652	0736	888	0	65	0339	0741
1653	0741	888	0	60	0365	3367
1654	3367	888	0	65	0370	0772
1655	0772	888	0	60	0378	3380
1656	3380	888	0	65	0383	0785
1657	0785	888	0	08	9999	3188
1658	3188	888	0	06	0001	0592
1659	0592	888	0	30	0794	0596
1660	0596	888	0	82	3399	3799
1661	3799	888	0	60	0218	0620
1662	0620	888	0	29	8418	3025
1663	3025	888	0	05	0827	8920
1664	0827	888	0	65	0281	0683
1665	0683	888	0	60	0286	0688
1666	0688	888	0	29	8468	0693
1667	0693	888	0	05	0895	8920
1668	0895	888	0	65	0250	0652
1669	0652	888	0	60	0255	0657
1670	0657	888	0	29	8518	0662
1671	0662	888	0	05	0864	8920
1672	0864	888	0	65	0241	0643
1673	0643	888	0	60	0246	0448
1674	0448	888	0	29	8568	0453
1675	0453	888	0	05	0455	8920
1676	0455	888	0	65	0209	0811
1677	0811	888	0	60	0214	0416
1678	0416	888	0	11	0201	3188
1679	3188	888	0	67	3333	000A
1680	3399	888	0	16	0016	4189
1681	88AG	888	0	25	8706	0970
1682	0970	888	1	08	0000	0573
1683	0573	888	0	08	9999	0976
1684	0976	888	0	05	0978	3780
1685	3780	888	0	30	0982	8810
1686	0978	888	0	60	85FC	3182
1687	3182	888	0	30	3184	4530
1688	3184	888	0	32	0100	3388
1689	3388	888	0	30	84FG	0792
1690	0792	888	0	90	000C	0796
1691	0796	888	0	25	85FC	0800
1692	0800	888	0	37	0400	3607
1693	3607	888	0	70	3009	000A
1694	3009	888	0	50	0000	83AG
1695	0982	888	0	25	8706	0986
1696	0986	888	0	06	0789	0789
1697	0789	888	0	69	1000	3202
1698	3202	888	0	32	0200	3807

-PAT

2PAT  
1  
NEW

2

1

STA	0325
STX	0330
STA	0334
STX	0339
STA	0365
STX	0370
STA	0378
STX	0383
LIR1	9999
IIR1	0001
LDL#	00005
TEQ	1F
STA	0218
LDA1	D0001
LDX	
STX	0281
STA	0286
LDA1	D0051
LDX	
STX	0250
STA	0255
LDA1	D0101
LDX	
STX	0241
STA	0246
LDA1	D0151
LDX	
STX	0209
STA	0214
PRN	0201
HLT	3333
PFD	0016
LDA	A
LIR3	0000
LIR1	9999
LDX	2F
LDL	1F
STA	ALOC
LDL	
SHR	0100
LDL	MC
SML	RX
LDA	ALOC
SHL	0400
ADD	
STL	0000
LDA	A
CLX	
STX1	STAB
SHR	0200

-PAT

00000

UNOG\*

UNOG\*

UNOG\*

UNOG\*

-PAT  
RA  
-PR1

FIND\*

PSIGN

RA  
PSUDX

G SPECIAL SECRET OF NEW  
G FIND A. IF UNDEFINED PUT IT AS OP IN  
G SYMBOL TABLE WITH EQUIVALENT IN M AND C.  
G IF DEFINED PUT CONTENTS OF M AND C INTO  
G THE QADAAD PROGRAM IN THIS LOCATION.

1699	3807	888	0	20	3209	3011
1700	3011	888	0	05	0413	0815
1701	0815	888	0	77	0815	0818
1702	0818	888	0	25	000C	8712
1703	0413	888	0	30	3015	4530
1704	3015	888	0	32	0100	0619
1705	0619	888	0	30	84FG	0623
1706	0623	888	0	90	000C	3027
1707	3027	888	0	54	2000	83AG
1708	8736	888	0	60	83FB	0740
1709	0740	888	0	65	84FB	0544
1710	0544	888	1	06	0001	0748
1711	0748	888	0	06	0751	0751
1712	0751	888	0	32	0400	0758
1713	0758	888	0	05	0760	8760
1714	8760	888	0	20	86FB	0766
1715	0766	888	0	37	0100	3170
1716	3170	888	0	60	86FB	0974
1717	0974	888	0	60	85AC	000C
1718	0760	888	1	06	9999	0764
1719	0764	888	0	25	83FB	0968
1720	0968	888	0	05	84FB	0008

	BUF#	88000	88000
	LDX	1F	
	ATL		
	LDA	RX	SRCH*
1	LDL		PSIGN
	SHR	0100	
	LDL	MC	
	SML	RX	
	STL1	ETAB	PSUDX
ERR1*	STA	TEMP	
	STX	TEMP1	
	IIR3	0001	
	CLX		
	SHR	0400	
	LDX	1F	ERR2*
ERR2*	BUF	ERROR	
	SHL	0100	
	STA	ERROR	
	STA	ACCUM	RX
1	IIR3	9999	
	LDA	TEMP	
	LDX	TEMP1	RL

G ERROR SUBROUTINE  
G ACCUMULATES IN ERROR THE ERROR CODES  
G FOR A LINE.  
G ERR1\*: CODE IS RB3+1. INDICATING THE FIELD  
G EXIT IS IN RL.  
G ERR2\*: CODE IS IN RA. EXIT IS IN RX.

0027544044  
0000544044  
0055544044  
0000044044  
0005544044  
0000544044  
0005544044  
0055544044  
0000544044  
0005544044  
0000544044  
0005544044  
0000544044  
0005544044  
0000544044  
0005544044  
0000000044  
0000044044  
0055544044  
0000004044  
0000544044  
0000544044  
0000544044  
0000544044  
0000044044  
0000044044  
0005544044  
0000044044  
0000544044  
0000000044  
0000004044  
0005044044  
0000004044  
0000044044  
0005044044  
0002044044  
0000044044  
0000044044  
0077044044  
0007044044  
2222000000



1722  
1723  
1724  
1725 0000 888 0 67 0000 0000  
1726 7801 888 0 25 7803 7805  
1727 7805 888 0 60 7902 7907  
1728 7907 888 0 62 0500 7925  
1729 7925 888 0 C7 7931 7925  
1730 7931 888 0 87 7935 7937  
1731 7935 888 0 67 7935 7907  
1732 7937 888 0 F6 8600 7901  
1733 7803 888 0 67 7803 7937  
1734 7901 888 0 08 0000 7905  
1735 7905 888 0 34 8601 7807  
1736 7807 888 0 29 8603 7809  
1737 7809 888 0 37 0400 7817  
1738 7817 888 0 90 000A 7821  
1739 7821 888 0 35 7823 7825  
1740 7825 888 0 20 7827 000A  
1741 7827 888 0 50 0000 7811  
1742 7811 888 0 06 0004 7819  
1743 7815 888 0 30 7819 7829  
1744 7829 888 0 82 7907 7905  
- 1745

0000  
Y0001  
  
2  
  
3  
1  
Y0101  
Y0105

BLR 0000  
BLA Y0003  
BLR Y0101  
HLT  
LDA 1F  
STA Y0102  
TRD OTAP1  
TBT  
TGR  
HLT  
TBU 8600  
HLT  
LIR1 0000  
LDL1 8601  
LOA1 8603  
SHL 0400  
SML RA  
ERS# 00HHH  
BUF  
STL 0000  
IIR1 0004  
LDL# 00020  
TEQ 28  
END 80P

4999  
Y0199 002  
Y0105 004  
\*  
  
2F  
  
\*  
3F  
28  
Y0101  
38  
Y0105  
  
  
H0000  
RA  
  
00000  
Y0105

G  
G  
SIMPLE OBJECT PROGRAM LOADING ROUTINE  
GOES INTO BAND 7800; THE ODD LOCATIONS.

IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

**Remington Rand Univac**  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.



IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

***Remington Rand Univac***  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.

0000  
0001  
0017  
0018  
0019  
0020  
0021  
0022  
0023  
0024  
0025  
0026  
0027  
0028  
0029  
0030  
0031  
0032  
0033  
0034  
0035  
0036  
0037  
0038  
0039  
0040  
0041  
0042  
0043  
0044  
0045  
0046  
0047  
0048  
0049  
0050  
0051  
0052  
0053  
0054  
0055  
0056  
0057  
0058  
0059  
0060  
0061  
0062  
0063

	FLO		
	BLR	0000	0399
B8AH	NEW1	00001	00000
50000	COR	0201	
60000	COR	0201	
70000	BLR	4800	4999
80000	COR	0014	
C0000	BLR	4030	4035
D0000	COR	0202	
E0000	COR	0006	
F0000	COR	0024	
I0000	COR	0010	
J0000	COR	0010	
L0000	BLR	4010	4015
M0000	BLR	4020	4025
Q0000	BLR	4000	4009
R0000	COR	0011	
U0000	COR	0004	
V0000	COR	0004	
W0000	EQU	5200	
X0000	COR	0006	
Y0000	EQU	7800	
Z0000	BLR	0989	0999
10000	COR	0005	
30000	COR	0007	
STAB	BLR	1000	1999
ETAB	BLR	2000	2999
A	COR	0001	
AH	COR	0001	
M	COR	0001	
MH	COR	0001	
C	COR	0001	
CH	COR	0001	
ITAP1	EQU	0300	
OTAP1	EQU	0500	
OTAP2	EQU	0600	
OTAP3	EQU	0700	
COMTS	BLR	3400	3599
CHTS1	EQU	3401	
STOPT	EQU	W9801	
EXIT	EQU	B0FB	
EXIT1	EQU	B1FB	
EXIT2	EQU	B2FB	
TEMP	EQU	B3FB	
TEMP1	EQU	B4FB	
TEMP2	EQU	B5FB	
ERROR	EQU	B6FB	
DEFX	EQU	B7FB	

2. QADAAD ASSEMBLER PASS 2.

CAUSES ASSEMBLY INTO BOQA - B99F AREA.

INPUT BUFFER  
INPUT BUFFER  
OUTPUT BUFFER  
BLA\*BLR CONTROL  
C ADDRESS CONTROL  
DRUM AVAILABILITY TABLE  
DEFN\* CONTROL  
FARB\* CONTROL  
FORWARD LOCAL TABLE  
BACKWARD LOCAL TABLE  
A ADDRESS CONTROL  
M ADDRESS CONTROL  
INDEX REGISTER CODES  
REMARKS  
H FIELDS  
H FIELD CONTROL

EQU CONTROL  
BAND FOR LOADING ROUTINE  
BLANK COMMENTS  
PAIR ADDRESS CONTROL  
EDITING  
SYMBOL TABLE  
EQUIVALENTS TABLE  
A FIELD ZZZZZNNNNN  
AH FIELD 00ZZZ00NNN

INPUT TAPE  
OUTPUT TAPE  
CONTROL FOR FLOW PASS -- PSEUDOCODE  
COMMENTS FOR FLOW PASS

VARIOUS TEMP STORAGES

ERRORS ON CURRENT LINE

0064  
0065  
0066  
0067  
0068  
0069  
0070  
0071  
0072  
0073  
0074  
0075  
0076  
0077  
0078  
0079  
0080  
0081  
0082  
0083  
0084  
0085  
0086  
0087  
0088  
0089  
0090  
0091  
0092  
0093  
0094  
0095  
0096  
0097  
0098  
0099  
0100  
0101  
0102  
0103  
0104  
0105  
0106  
0107  
0108  
0109  
0110  
0111  
0112  
0113

UDEFX	EQU	88FB
SYMBL	EQU	89FB
INCRE	EQU	80FC
PANIC	EQU	81FC
MASK	EQU	82FC
CORE	EQU	83FC
BLANK	EQU	84FC
ALOC	EQU	85FC
MLOC	EQU	86FC
CLOC	EQU	87FC
DEXIT	EQU	88FC
SIGN	EQU	89FC
R	EQU	80FG
LINE	EQU	81FG
MCN	EQU	82FG
MCZ	EQU	83FG
MC	EQU	84FG
OP	EQU	85FG
IR	EQU	86FG
TAPE1	EQU	87FG
TCONT	EQU	88FG
LTAPE	EQU	89FG
TEX1	EQU	80FH
TEX	EQU	81FH
AEX	EQU	82FH
ALEV	EQU	83FH
MLEV	EQU	84FH
CLEV	EQU	85FH
HTAG	EQU	86FH
FTAG	EQU	87FH
RTAG	EQU	88FH
OPTIM	EQU	89FH
SHR1	EQU	80AC
SHR2	EQU	81AC
LC	EQU	82AC
LINE0	EQU	83AC
FLAG	EQU	84AC
ACCUM	EQU	85AC
MUMI	EQU	86AC
MUML	EQU	87AC
COMI	EQU	88AC
KEY	EQU	89AC
DK	EQU	80AB
HSB	EQU	84AB
HSB1	EQU	89AB
BLA	EQU	80AG
BLR	EQU	81AG
COR	EQU	82AG
PSUDX	EQU	83AG
EQU	EQU	84AG

NUM CONSTANT  
ZON CONSTANT  
CON CONSTANT

LINE COUNTER IN INPUT BUFFER  
CONTROL FOR TAPE BUFFER UNLOAD  
LAST TAPE COMMAND

LINE COUNTER ON OUTPUT PAGE  
LINE COUNTER IN OUTPUT BUFFER

ERRORS ON LAST ERRONEOUS LINE

CONTROL OPS STARTING LOCATIONS

0114							HHH	EQU	B5AG		
0115							FLO	EQU	B6AG		
0116							END	EQU	B7AG		
0117							NEW	EQU	B8AG		
0118							CON	EQU	B0AH		
0119							NUM	EQU	B1AH		
0120							ZON	EQU	B2AH		
0121							PAT	EQU	B3AH		
0122							ALF	EQU	B4AH		
0123							OFF	EQU	B5AH		
0124							TYP	EQU	B6AH		
0125							FUNNY	EQU	B8AH		
0126							BOP1	EQU	B9AH		
0127	B679	BBB	0	HH	HHHH	HHHH	ROO10	CON	HHHHH	HHHHH	
0128	B3FH	BBB	0	00	0000	0000	ALEV	CON	00000	00000	
0129	B4FH	BBB	0	00	0000	0000	MLEV	CON	00000	00000	
0130	B5FH	BBB	0	00	0000	0000	CLEV	CON	00000	00000	
0131	B5FC	BBB	0	00	0000	0000	ALOC	CON	00000	00000	
0132	B6FC	BBB	0	00	0000	0000	MLOC	CON	00000	00000	
0133	B7FC	BBB	0	00	0000	0000	CLOC	CON	00000	00000	
0134	B7AC	BBB	0	00	0000	0000	MUML	CON	00000	00000	
0135	B8AH	BBB	0	00	2000	0000	FUNNY	CON	00200	00000	
0136	B4AB	BBB	0	22	2220	0000	HSB	CON	22222	00000	
0137	B9AB	BBB	0	00	0000	4000	HSB1	CON	00000	04000	
0138							HHH				

C

B00A - B99F PART OF CORE USUALLY UNAVAILABLE  
WHAT GADAAD CHOOSES FOR H  
HIGH-SPEED BANDS

0139	8712	888	0	60	81FB	800A
0140	800A	888	0	65	82FB	801A
0141	801A	888	0	50	83FB	802A
0142	802A	888	0	26	8713	8713
0143	8713	888	0	75	0008	803A
0144	803A	888	0	77	803A	804A
0145	804A	888	0	85	8714	805A
0146	805A	888	0	32	0600	806A
0147	806A	888	0	07	0HHH	807A
0148	807A	888	0	35	000C	808A
0150	808A	888	0	30	83FB	8716
0152	8716	888	0	20	8717	000A
0153	8717	888	0	08	0000	8715
0154	8715	888	0	29	1000	809A
0155	809A	888	0	82	8718	810A
0156	810A	888	0	70	8719	8720
0157	8719	888	0	99	9999	9999
0158	8721	888	0	06	0023	811A
0159	811A	888	0	70	8722	8715
0160	8722	888	0	99	9000	0000
0162	8720	888	0	54	1000	81FB
0163	8718	888	0	29	2000	82FB
0166						
0167						
0168						
0169						
0170						
0171						
0172						
0173						

SRCH\*

&SR2

-SR2

&SR1

-SR1

3

STA	EXIT1	
STX	EXIT2	
STL	TEMP	
CLA		
SUB	RL	
ATL		
MUL#	10010	01001
SHR	0600	
IIR	0HHH	
ERS	RX	
LDL	TEMP	&SR2
BUF		RA
LIR1	0000	-SR2
LDA1	STAB	
TEQ	3F	
ADD		-SR1
CON	99999	99999
IIR1	0023	
ADD		-SR2
CON	99900	00000
STL1	STAB	EXIT1
LDA1	ETAB	EXIT2

S. SYMBOL TABLE SEARCH (SRCH\*)

S1. SCRAMBLE

S2. SYMBOL:TABLE

S3. TABLE:ZERO

S4. NOT FOUND.

0174	8723	888	0	50	80FB	812A
0175	812A	888	1	09	8707	813A
0176	813A	888	0	70	8724	814A
0177	814A	888	0	60	83FB	815A
0179	815A	888	0	31	8725	8725
0180	8725	888	0	50	81FC	816A
0181	816A	888	5	02	0000	8726
0182	8726	888	0	30	000C	8727
0183	8727	888	0	50	8683	817A
0184	817A	888	0	25	8728	818A
0185	818A	888	0	82	8729	8730
0186	8729	888	0	30	86FH	819A
0187	819A	888	0	82	8684	820A
0188	820A	888	0	05	0008	8727
0189	8730	888	5	25	8680	821A
0190	821A	888	5	82	8684	822A
0191	822A	888	5	07	0001	8730
0192	8680	888	0	00	1000	0488
0193	8681	888	0	00	1000	0388
0194	8682	888	0	00	1000	0888
0195	8687	888	0	25	0008	823A
0196	823A	888	0	75	000A	824A
0197	824A	888	0	31	8731	8731
0198	8731	888	0	82	8732	825A
0199	825A	888	0	30	8733	826A
0200	826A	888	0	82	8734	827A
0201	827A	888	1	06	0001	828A
0202	828A	888	0	30	8735	8736
0203	8735	888	1	06	9999	8684
0204	8732	888	0	25	0008	829A
0205	829A	888	0	70	8737	8738
0206	8737	888	0	00	7000	0000
0207	8739	888	0	70	83FB	830A
0208	830A	888	0	60	83FB	8684
0209	8738	888	5	07	9998	831A
0210	831A	888	0	60	81FC	832A
0211	832A	888	0	65	83FB	8740
0212	8734	888	0	25	8741	833A
0213	833A	888	0	60	81FC	834A
0214	834A	888	0	35	000C	835A
0215	835A	888	0	60	83FB	8740
0216	8740	888	5	07	9999	8684
0217	8684	888	1	07	0000	8742
0218	8686	888	1	07	0000	8742
0219	8742	888	0	70	8743	8744
0220	8743	888	0	99	9995	0000
0221	8744	888	0	26	8746	8746
0222	8745	888	5	07	0001	836A
0223	836A	888	3	07	0000	8746

FARB\*

2

3

3

U0000

U0001

U0002

V0003

1

&NU

-NU

3

2

V0000

V0002

2

-F1

&F1

STL	EXIT
LDX3	AM
ADD#	00000
STA	TEMP
CLL	
STL	PANIC
LIR6	0000
LDL	RX
STL	U0003
LDAN	00000
TEQ	
LDL	HTAG
TEQ	V0000
LDX	RL
LDA6	U0000
TEQ6	V0000
IIR6	0001
CON	00100
CON	00100
CON	00100
LDA	RL
SUB	RA
CLL	
TEQ	1F
LDL#	00000
TEQ	3F
IIR3	0001
LDL	
IIR3	9999
LDA	RL
ADD	
CON	00700
ADD	TEMP
STA	TEMP
IIR6	9998
STA	PANIC
STX	TEMP
LDAN	00000
STA	PANIC
ERS	RX
STA	TEMP
IIR6	9999
IIR2	0000
IIR2	0000
ADD	
CON	99999
CLA	3F
IIR6	0001
IIR5	0000

10000

2F

3F

00888

3F

3B

3B

00488

00388

00888

00400

ERR1\*

V0000

-NU

00000

V0000

2F

000HH

2F

V0000

2F

2F

-F1

50000

3F

F. FIND AND RESERVE BEST LOCATION (FARB\*)

F1. EXAMINE H-FIELD

F2. USE HAND LEVEL

F3. ADJUST FOR PAIRS

0224	8746	888	0	60	84FB	8747
0228	8685	888	1	07	0000	837A
0229	837A	888	0	70	8749	8750
0230	8749	888	0	99	9995	0000
0231	8750	888	0	07	0001	8752
0232	8751	888	0	07	0002	8752
0233	8752	888	0	70	83FC	838A
0234	838A	888	0	05	000A	839A
0235	839A	888	0	70	8753	8754
0236	8753	888	0	99	9000	0000
0237	8754	888	0	65	83FC	840A
0238	840A	888	0	65	88AB	841A
0239	841A	888	8	07	8999	842A
0240	842A	888	0	60	8695	843A
0241	843A	888	8	07	0001	8756
0242	8755	888	0	25	8758	844A
0243	844A	888	0	05	8759	8760
0244	8759	888	0	00	8761	8761
0245	8761	888	5	07	0001	8686
0246	8747	888	0	25	83FB	845A
0247	845A	888	0	37	0400	846A
0248	846A	888	0	70	84FB	847A
0249	847A	888	0	77	847A	848A
0250	848A	888	0	60	84AC	849A
0251	849A	888	5	00	8641	8641
0252	8642	888	0	85	8762	8763
0253	8641	888	0	85	8762	8763
0254	8762	888	0	00	0000	00A5
0255	8763	888	0	35	8764	850A
0256	850A	888	0	70	000A	8765
0257	8643	888	0	35	8766	8765
0258	8644	888	0	35	8766	8765
0259	8766	888	0	00	00CH	0000
0260	8765	888	0	60	86AB	851A
0261	851A	888	0	31	8767	8767
0262	8767	888	0	25	8617	852A
0263	852A	888	0	60	8417	8768
0264	8768	888	6	25	8418	853A
0265	853A	888	5	00	8629	8629
0266	8630	888	6	35	8417	8629
0267	8631	888	6	20	8468	854A
0268	854A	888	6	20	8518	855A
0269	855A	888	6	20	8568	8770
0270	8770	888	0	35	84AB	8629
0271	8632	888	6	35	8417	856A
0272	856A	888	0	05	000A	857A
0273	857A	888	6	25	8468	858A
0274	858A	888	6	35	8467	859A
0275	859A	888	0	20	000C	860A
0276	860A	888	0	05	000A	861A

3	STA	TEMP1	-FAR8
V0001	IIR2	0000	
	ADD		-F8
	CON	99999	50000
-F8	IIR	0001	1F
8FB	IIR	0002	1F
1	ADD	CORE	
	LDX	RA	
	ADD		-F9
	CON	99900	00000
-F9	STX	CORE	
	STX	RB9	
	IIR9	8999	
	STA	10001	
	IIR9	0001	FAREX
8F9	LDAX	00000	0000G
	LDX		ERR2*
	JMP		
	IIR6	0001	V0002
-FAR8	LDA	TEMP	
	SHL	0400	
	ADD	TEMP1	
	ATL		
	STA	FLAG	
	JMP6	F0016	
F0017	MUL	1F	2F
F0016	MUL	1F	2F
1	CON	00000	000A5
2	ERS#	0000H	H5000
	ADD	RA	3F
F0018	ERS	1F	3F
F0019	ERS	1F	3F
1	CON	0000C	H0000
3	STA	RB7	
	CLL		
	LDA	D0200	
	STA	D0000	-F2
-F2	LDA7	D0001	
	JMP6	F0004	
F0005	ERS7	D0000	F0004
F0006	BUF7	D0051	
	BUF7	D0101	
	BUF7	D0151	1F
1	ERS	HSB	F0004
F0007	ERS7	D0000	
	LDX	RA	
	LDA7	D0051	
	ERS7	D0050	
	BUF	RX	
	LDX	RA	

F4. ROOM IN CORE

F5. ASSIGN CORE ADDR.

F6. INITIALIZE

F7. TRY LEVEL



0277	861A	888	6	25	8518	862A
0278	862A	888	6	35	8517	863A
0279	863A	888	0	20	000C	864A
0280	864A	888	0	05	000A	865A
0281	865A	888	6	25	8568	866A
0282	866A	888	6	35	8567	867A
0283	867A	888	0	20	000C	8770
0284	8629	888	0	82	8771	8772
0285	8771	888	0	25	81FC	868A
0286	868A	888	0	82	8773	869A
0287	869A	888	0	50	81FC	870A
0288	870A	888	0	25	8774	871A
0289	871A	888	0	05	8775	8760
0290	8775	888	0	00	8773	8773
0291	8773	888	6	07	0001	872A
0292	872A	888	5	70	8645	8768
0293	8645	888	0	99	9800	0000
0294	8646	888	0	99	9800	0000
0295	8647	888	0	99	9950	0000
0296	8648	888	0	99	9950	0000
0297	8769	888	0	25	84AC	873A
0298	873A	888	0	82	8776	874A
0299	874A	888	0	50	84AC	875A
0300	875A	888	6	02	0000	8768
0301	8776	888	0	25	8777	876A
0302	876A	888	0	05	8778	8760
0303	8778	888	0	00	8779	8779
0304	8779	888	5	07	9998	877A
0305	877A	888	0	70	8780	8747
0306	8780	888	0	99	9998	0000
0307	8748	888	0	26	8781	8781
0308	8781	888	0	60	8695	8756
0309	8772	888	5	00	8633	8633
0310	8635	888	6	25	8418	8782
0311	8782	888	0	35	84A8	878A
0312	878A	888	0	82	8783	8784
0313	8783	888	6	07	0050	8772
0314	8636	888	6	25	8418	879A
0315	879A	888	6	35	8417	8782
0316	8633	888	6	25	8418	8784
0317	8634	888	6	25	8418	880A
0318	880A	888	6	35	8417	8784
0319	8784	888	0	05	000A	881A
0320	881A	888	0	35	8785	882A
0321	882A	888	0	82	8786	883A
0322	883A	888	0	35	8787	884A
0323	884A	888	0	82	8788	885A
0324	885A	888	0	35	8789	886A
0325	886A	888	0	82	8790	887A
0326	887A	888	0	25	8791	8792

F0004

3

F0020

F0021

F0022

F0023

&F2

1

&FARB

2

F0010

1

F0011

F0008

F0009

2

LDA7	D0101
ERS7	D0100
BUF	RX
LDX	RA
LDA7	D0151
ERS7	D0150
BUF	RX
TEQ	
LDA	PANIC
TEQ	3F
STL	PANIC
LDA#	00000
LDX	
JMP	3F
IIR7	0001
ADD6	F0020
CON	99980
CON	99980
CON	99995
CON	99995
LDA	FLAG
TEQ	1F
STL	FLAG
LIR7	0000
LDA#	00000
LDX	
JMP	
IIR6	9998
ADD	
CON	99999
CLA	
STA	10001
JMP6	F0008
LDA7	D0001
ERS	H5B
TEQ	
IIR7	0050
LDA7	D0001
ERS7	D0000
LDA7	D0001
LDA7	D0001
ERS7	D0000
LDX	RA
ERS#	GGGGG
TEQ	1F
ERS#	99999
TEQ	2F
ERS#	55555
TEQ	3F
LDA	

1B

2F

0000G

ERR2\*

-F2

00000

00000

00000

00000

-F2

0000G

ERR2\*

-FARB

80000

FAREX

1F

2F

2B

1B

2F

2F

GGGGG

99999

55555

4F

F8. DRUM EXHAUSTED

F9. CALCULATE ADDRESS

0327	B791	888	0	CH	HHHH	HHHH
0328	B790	888	0	25	B793	B98A
0329	B88A	888	0	30	B794	B792
0330	B794	888	0	00	2000	0000
0331	B788	888	0	25	B795	B89A
0332	B89A	888	0	30	B796	B792
0333	B796	888	0	00	4000	0000
0334	B786	888	0	25	B797	B90A
0335	B90A	888	0	30	B798	B792
0336	B798	888	0	00	6000	0000
0337	B792	888	0	50	B8AB	B91A
0338	B91A	888	0	30	000C	B92A
0339	B92A	888	0	05	B799	B800
0340	B799	888	0	HH	HHHH	HHHH
0341	B800	888	0	60	B2FC	B93A
0342	B93A	888	0	35	000B	B94A
0343	B94A	888	0	82	B801	B802
0344	B801	888	8	07	0200	B95A
0345	B95A	888	0	25	B2FC	B96A
0346	B96A	888	0	32	0100	B800
0347	B802	888	5	00	B637	B637
0348	B639	888	6	25	B418	B97A
0349	B97A	888	0	35	B2FC	B637
0350	B638	888	6	25	B417	B803
0351	B640	888	6	25	B417	B803
0352	B803	888	0	35	B2FC	B98A
0353	B98A	888	6	60	B417	B639
0354	B637	888	6	60	B418	B99A
0355	B99A	888	0	25	B417	B00F
0356	B00F	888	0	35	B617	B01F
0357	B01F	888	0	60	B617	B02F
0358	B02F	888	6	07	0000	B03F
0359	B03F	888	0	31	B804	B804
0360	B804	888	0	82	B805	B806
0361	B805	888	0	07	0199	B807
0362	B806	888	0	75	B808	B807
0363	B808	888	0	00	0001	0000
0364	B807	888	0	70	B8AB	B04F
0365	B04F	888	0	60	B695	B05F
0366	B05F	888	6	07	0000	B06F
0367	B06F	888	0	70	B8AB	B756
0368	B756	888	0	06	B809	B809
0369	B809	888	0	60	B694	B07F
0370	B07F	888	0	60	B696	B08F
0371	B08F	888	0	32	0400	B0FB

3	CON	CHHHH	HHHHH
	LDA#	BHHHH	HHHHH
	LDL		4F
	CON	00200	00000
2	LDA#	FHHHH	HHHHH
	LDL		4F
	CON	00400	00000
1	LDA#	GHHHH	HHHHH
	LDL		4F
	CON	00600	00000
4	STL	RB9	
	LDL	RX	
	LDX		1F
	CON	HHHHH	HHHHH
1	STA	MASK	
	ERS	RL	
	TEQ		1F
	IIR9	0200	
	LDA	MASK	
	SHR	0100	1B
1	JMP6	F0012	
F0014	LDA7	D0001	
	ERS	MASK	F0012
F0013	LDA7	D0000	1F
F0015	LDA7	D0000	1F
1	ERS	MASK	
	STA7	D0000	F0014
F0012	STA7	D0001	
	LDA	D0000	
	ERS	D0200	
	STA	D0200	
	IIR7	0000	
	CLL		
	TEQ		1F
	IIR	0199	2F
1	SUB		2F
	CON	00000	10000
2	ADD	RB9	
	STA	10001	
	IIR7	0000	
	ADD	RB9	FAREX
FAREX	CLX		
	STA	10000	
	STA	10002	
	SHR	0400	EXIT

F10.RESERVE ADDRESS.

F11.FINISH UP

0372	8810	888	1	29	8706	809F
0373	809F	888	0	65	87FB	810F
0374	810F	888	0	50	88FB	811F
0375	811F	888	0	60	89FB	812F
0376	812F	888	0	30	8811	813F
0377	813F	888	0	82	8812	814F
0378	814F	888	0	30	8813	815F
0379	815F	888	0	82	8814	816F
0380	816F	888	0	35	8815	817F
0381	817F	888	0	30	8816	818F
0382	818F	888	0	82	8817	819F
0383	819F	888	0	25	89FB	820F
0384	820F	888	0	35	8818	821F
0385	821F	888	0	C1	821F	822F
0386	822F	888	0	20	8819	823F
0387	823F	888	0	35	89FB	824F
0388	824F	888	0	35	8820	825F
0389	825F	888	0	31	8821	8821
0390	8821	888	0	50	80FC	826F
0391	826F	888	0	82	8822	827F
0392	827F	888	0	25	89FB	828F
0393	828F	888	0	35	8823	829F
0394	829F	888	0	60	83AB	830F
0395	830F	888	0	35	8824	831F
0396	831F	888	0	C1	831F	832F
0397	832F	888	0	20	8825	833F
0398	833F	888	0	35	89FB	834F
0399	834F	888	0	35	8826	835F
0400	835F	888	0	30	8827	836F
0401	836F	888	0	82	8828	837F
0402	837F	888	0	30	8829	838F
0403	838F	888	0	82	8830	839F
0404	839F	888	0	30	8831	840F
0405	840F	888	0	82	8832	841F
0406	841F	888	0	25	89FB	842F
0407	842F	888	0	35	8833	843F
0408	843F	888	0	30	8834	844F
0409	844F	888	0	82	8835	845F
0410	845F	888	0	30	8836	846F
0411	846F	888	0	82	8837	847F
0412	847F	888	0	31	8838	8838
0413	8838	888	0	35	8839	848F
0414	848F	888	0	82	8840	849F
0415	849F	888	1	02	0004	8841
0416	8837	888	3	02	0001	8842
0417	8835	888	3	02	0000	8842
0418	8842	888	1	02	0005	8841
0419	8812	888	0	31	8843	8843
0420	8843	888	0	25	84FC	850F

FIND\*

MINUS  
PLUS  
1  
BLNK

LDA3	A	
STX	DEFX	
STL	UDEFX	
STA	SYMBL	
LDLN	00000	88888
TEQ	BLNK	
LDLN	20000	88888
TEQ	SELF	
ERSN	H0000	H0000
LDLN	00000	80000
TEQ	ABS	
LDA	SYMBL	
ERSN	00000	03333
MTX		
BUFN	0HHHH	00000
ERS	SYMBL	
ERSN	0HHHH	04444
CLL		
STL	INCR	
TEQ	REG	
LDA	SYMBL	
ERSN	00000	H0000
STA	RB5	
ERSN	00000	30000
MTX		
BUFN	HHHHH	0HHHH
ERS	SYMBL	
ERSN	HHHHH	4HHHH
LDLN	01000	06888
TEQ	LOCF	
LDLN	01000	02888
TEQ	LOCB	
LDLN	00000	08888
TEQ	LOCL	
LDA	SYMBL	
ERSN	H0000	H0000
LDLN	10000	C0000
TEQ	PLUS	
LDLN	00000	A0000
TEQ	MINUS	
CLL		
ERSN	H0000	00000
TEQ	ADERR	
LIR2	0004	LOOK1
LIR5	0001	1F
LIR5	0000	1F
LIR2	0005	LOOK1
CLL		
LDA	BLANK	

Q. MASTER ADDRESS CALCULATOR (FIND\*)

Q1. WHAT KIND

Q2. BLANK:ZERO

FEX	LIR2	0002	FEX
SELF	TEQ	UDEFX	DEFX
REG	LDA	ALOC	DEFX
	LDA	SYMBL	
	ERS#	00000	OH HHHH
	STA	INCRE	
	LDA	SYMBL	
	ERS#	H0000	H0000
ABS	LIR2	0000	LOOK
	LDA	SYMBL	
	CLL		
	ERS#	02222	00000
	TEQ		ADERR
	LDA	SYMBL	
	ERS#	HHHHH	OH HHHH
	SUB	RA	
ADERR	TEQ	1F	ADERR
	LDL		ERR1*
1	CLA	DEFX	
	LDA	SYMBL	
	ERS#	01111	00000
	ADD	RA	
	ADD	RA	
	SHR	0500	
	BUF	SYMBL	
	ERS		DEFX
LOCF	CON	00000	OH HHHH
	LDA5	I0000	
	CLL		
LOCB	LIR2	0001	FEX
	LDA5	J0000	
	CLL		
LOCL	TEQ	ADERR	DEFX
	LDA5	I0000	
	CLL		
	STL5	I0000	
	LIR2	0003	
	TEQ	UDEFX	
LOOK1	STA5	J0000	DEFX
LOOK	LDA	SYMBL	LOOK
	ATL		
	LDA	UDEFX	
	LDX		SRCH*
	ADD	INCRE	
	ERS		DEFX
	CON	00000	OH HHHH

**Q10.SRCH\***

FEX  
DEFX  
DEFX  
OH HHHH  
HO OOOO  
LOOK  
OO OOOO  
ADERR  
OH HHHH  
ADERR  
ERR 1\*  
OO OOOO  
DEFX  
OH HHHH  
FEX  
DEFX  
DEFX  
LOOK  
SRCH\*  
DEFX  
OH HHHH

0487	8861	888	1	00	8619	8619
0493	8619	888	0	05	000A	876F
0494	876F	888	0	25	8862	877F
0495	877F	888	0	75	80FC	878F
0496	878F	888	0	32	0F00	879F
0497	879F	888	0	70	000C	880F
0498	880F	888	0	35	8863	8623
0499	8863	888	0	00	0000	HHHH
0500	8620	888	3	60	8649	000B
0501	8621	888	0	60	84FC	000B
0507	8622	888	3	60	8659	000B
0508	8623	888	0	64	2000	000B
0509	8624	888	0	50	88FC	881F
0510	881F	888	3	25	8694	882F
0511	882F	888	0	06	8864	8864
0512	8864	888	0	32	0400	883F
0513	883F	888	0	64	2000	884F
0514	884F	888	0	60	84FB	885F
0515	885F	888	0	29	1000	886F
0516	886F	888	3	00	8697	8697
0517	8697	888	0	35	8865	8866
0518	8865	888	0	0H	HHHA	HHHH
0519	8698	888	0	20	8867	8866
0520	8867	888	0	10	000C	0000
0521	8866	888	0	77	8866	887F
0522	887F	888	0	25	8868	8712
0523	8868	888	0	00	8869	8869
0524	8869	888	3	25	8695	888F
0525	888F	888	0	06	8870	8870
0526	8870	888	0	32	0400	889F
0527	889F	888	0	64	2000	890F
0528	890F	888	0	25	84FB	88FC

DEFN\*  
E0000

E0001  
E0002  
E0003  
E0004  
E0005

10003

10004

1

JMP2	E0000
LDX	RA
LDAN	00000
SUB	INCR
SHR	0F00
ADD	RX
ERS	
CON	00000
STA5	10000
STA	BLANK
STA5	J0000
STA1	ETAB
STL	DEXIT
LDA5	10000
CLX	
SHR	0400
STA1	ETAB
STA	TEMP1
LDA1	STAB
JMP5	10003
ERS	
CON	0HHHH
BUF	
CON	10000
ATL	
LDA	
JMP	
LDA5	10001
CLX	
SHR	0400
STA1	ETAB
LDA	TEMP1

10000

E0004

0HHHH

RL

RL

RL

RL

1F

AHHHH

1F

C0000

SRCH\*

DEXIT

0. DEFINE ADDRESS (DEFN\*)

01. WHAT TYPE

02. CALCULATE BASE

03. STORE TWO.

0529	8871	888	0	50	80FB	891F
0536	891F	888	0	30	000A	892F
0537	892F	888	0	25	8872	8873
0538	8872	888	1	00	0000	0000
0539	8873	888	0	70	0008	893F
0540	893F	888	0	82	8874	894F
0541	894F	888	0	25	89FH	80FB
0542	8874	888	0	60	84FB	895F
0543	895F	888	0	70	8875	896F
0544	896F	888	0	75	89FH	897F
0545	897F	888	0	60	83FB	898F
0546	898F	888	0	25	0008	899F
0547	899F	888	0	35	8876	8877
0548	8877	888	0	30	89AB	8878
0549	8878	888	0	82	8879	8880
0550	8880	888	0	30	83FB	8881
0551	8881	888	0	85	8882	8883
0552	8883	888	0	30	000C	8884
0553	8884	888	0	25	8885	8886
0554	8885	888	0	99	0A00	0000
0555	8879	888	0	25	83FB	8887
0556	8887	888	0	35	8888	8889
0557	8889	888	0	77	8889	8890
0558	8890	888	0	70	89FH	8891
0559	8891	888	0	60	84FB	8892
0560	8892	888	0	25	8893	8886
0561	8893	888	0	00	0000	0048
0562	8886	888	0	87	8894	8895
0563	8895	888	0	25	8896	8897
0564	8897	888	0	05	8894	8760
0565	8894	888	0	25	84FB	8898
0566	8898	888	0	35	8899	80FB
0567	8899	888	0	00	0000	0HHH

AJST\*

8

1

1

2

1

STL	EXIT	
LDL	RA	
LDA		8F
CON1	00000	00000
ADD	RL	
TEQ	1F	
LDA	OPTIM	EXIT
STA	TEMP1	
ADD#	00000	10000
SUB	OPTIM	
STA	TEMP	
LDA	RL	
ERS#	00000	0H000
LDL	H5B1	
TEQ	1F	
LDL	TEMP	
MUL#	00000	0A005
LDL	RX	
LDA		2F
CON	990A0	00000
LDA	TEMP	
ERS#	00000	000CH
ATL		
ADD	OPTIM	
STA	TEMP1	
LDA		2F
CON	00000	00048
TGR	1F	
LDAN	00000	0000A
LDX	1F	ERR2*
LDA	TEMP1	
ERS		EXIT
CON	00000	00HHH

A. AJST\* SUBROUTINE.  
A1. WHAT TYPE ADDRESS

A2. FIGURE DRUM ROLL

A3. CHECK BAD TIMING.

0568	8900	888	0	50	8901	8903
0569	8903	888	0	77	8903	8904
0570	8904	888	0	25	83AC	8905
0571	8905	888	0	20	8906	000A
0572	8906	888	0	08	0000	8907
0573	8907	888	0	69	4803	8908
0574	8908	888	0	50	84FB	8909
0575	8909	888	0	65	85FB	8910
0576	8910	888	0	06	0004	8911
0577	8911	888	0	60	83AC	8912
0578	8912	888	0	54	4797	8913
0579	8913	888	0	70	8914	8901
0580	8914	888	0	99	9800	0000
0581	8902	888	0	60	83AC	8915
0582	8915	888	0	05	8916	8917
0583	8917	888	0	30	8918	8919
0584	8918	888	0	C6	4800	8916
0585	8916	888	0	H2	0500	8901
0586	8920	888	0	65	81FB	8921
0587	8921	888	0	05	000A	8922
0588	8922	888	0	35	8923	8924
0589	8924	888	0	C1	8924	8925
0590	8925	888	0	35	000C	8926
0591	8926	888	0	35	8927	8928
0592	8928	888	0	70	8929	8930
0593	8930	888	0	77	8930	8931
0594	8931	888	0	20	8932	8933
0595	8933	888	0	35	000C	8934
0596	8934	888	0	05	000A	8935
0597	8935	888	0	25	8936	8937
0598	8937	888	0	35	000B	81FB
0599						

OTPT\*

&OEX

2  
UNDG\*

STL	-OEX	
ATL		
LDA	LINE0	
BUF		RA
LIR1	0000	
STX1	70003	
STL	TEMP1	
STX	TEMP2	
IIR1	0004	
STA	LINE0	
STL1	79997	
ADD		-OEX
CON	99980	00000
STA	LINE0	
LDX	2F	
LDL		TSUB*
TBL	70000	2F
TWR	OTAP1	-OEX
STX	EXIT1	
LDX	RA	
ERS#	33333	33333
MTX		
ERS	RX	
ERS#	44444	44444
ADD#	44444	44444
ATL		
BUF#	88888	88888
ERS	RX	
LDX	RA	
LDA#	11111	11111
ERS	RL	EXIT1
HHH		H

0. OUTPUT SUBROUTINE.

01. TRANSFER

02. BUFFER FULL

03. WRITE TAPE

THIS IS AN EDITING SUBROUTINE WHICH TAKES  
A TEN DIGIT WORD IN RA AND PRODUCES IN  
COMPUTER CODE THE CONVENTIONAL NOTATION FOR  
UNDIGITS, ABCFGH. THE ZONE WORD IS PUT INTO  
RA, NUMERIC IN RX AT EXIT.



0600	4200	888	0	26	4203	4203
0601	4201	888	0	26	4203	4203
0602	4203	888	0	60	B0FG	4207
0603	4207	888	0	60	B9FC	4211
0604	4211	888	0	60	B6FB	4215
0605	4215	888	0	29	B001	4220
0606	4220	888	0	05	000A	4224
0607	4224	888	0	75	B1FG	4029
0608	4029	888	0	30	4231	4233
0609	4233	888	0	82	4036	4236
0610	4236	888	0	67	1111	4036
0611	4036	888	0	65	B1FG	4040
0618	4040	888	0	29	B003	4045
0619	4045	888	0	09	B009	4400
0620	4400	888	0	32	0500	4208
0621	4208	888	0	20	4210	4212
0622	4212	888	0	60	0334	4436
0623	4436	888	0	25	000C	4240
0624	4240	888	0	20	4042	4044
0625	4044	888	0	60	0218	4420
0626	4420	888	0	29	B002	4225
0627	4225	888	0	09	B008	4230
0628	4230	888	0	32	0500	4038
0629	4038	888	0	60	0339	4041
0630	4041	888	0	65	0223	4425
0631	4425	888	0	29	B007	4430
0632	4430	888	0	20	4232	4234
0633	4234	888	0	09	B006	4039
0634	4039	888	0	60	0241	4043
0635	4043	888	0	65	0246	4048
0636	4048	888	0	29	B005	4403
0637	4403	888	0	20	4205	4407
0638	4407	888	0	09	B004	4412
0639	4412	888	0	60	0303	4405
0640	4405	888	0	65	0308	4410
0641						
0642	4410	888	1	02	0000	B938
0643	B938	888	0	29	B003	B940
0644	B940	888	0	06	B941	B941
0645	B941	888	0	32	0500	B942
0646	B942	888	1	60	B699	B943
0647	B943	888	0	25	B0FG	B944
0648	B944	888	0	32	0900	B945
0649	B945	888	0	65	B0FG	B946
0650	B946	888	0	06	B947	B947
0651	B947	888	0	32	0700	B948
0652	B948	888	1	60	B707	B949
0653	B949	888	0	29	B002	B950
0654	B950	888	0	35	B951	B952

START  
STRT  
1

1

-ST

CLA	IF	
CLA	IF	
STA	R	
STA	SIGN	
STA	ERROR	
LDA1	B001	
LDX	RA	
SUB	LINE	
LDL#	00000	00001
TEQ	IF	
HLT	1111	IF
STX	LINE	
LDA1	B003	
LDX1	B009	
SHR	0500	
BUF#	88888	00000
STA	0334	
LDA	RX	
BUF#	00008	00008
STA	0218	
LDA1	B002	
LDX1	B008	
SHR	0500	
STA	0339	
STX	0223	
LDA1	B007	
BUF#	00000	00008
LDX1	B006	
STA	0241	
STX	0246	
LDA1	B005	
BUF#	00000	00008
LDX1	B004	
STA	0303	
STX	0308	
HHH		C
LIR2	0000	-ST
LDA1	B003	
CLX		
SHR	0500	
STA2	30000	
LDA	R	
SHR	0900	
STX	R	
CLX		
SHR	0700	
STA2	AH	
LDA1	B002	
ERS#	HHHHH	00000

E. EDIT INPUT CARD.

E1. CHECK LINE NO.

E2. TRANSFER

E3. SEPARATE OFF R. H.

0655	8952	888	1	60	8700	8953
0656	8953	888	1	20	8699	8954
0657	8954	888	1	60	8706	8955
0658	8955	888	0	29	8002	8956
0659	8956	888	0	37	0400	8957
0660	8957	888	0	35	8958	8959
0661	8959	888	1	20	8707	8960
0662	8960	888	1	60	8707	8961
0663	8961	888	0	06	0002	8962
0664	8962	888	1	07	0002	8963
0665	8963	888	0	70	8964	8938
0666	8964	888	0	99	9994	0000
0667						
0668	8939	888	0	29	8004	4244
0669	4244	888	0	60	8669	4248
0670	4248	888	0	29	8005	4603
0671	4603	888	0	20	4603	4607
0672	4607	888	0	60	8670	4411
0673	4411	888	0	29	8006	4016
0674	4016	888	0	60	8671	4620
0675	4620	888	0	29	8007	4625
0676	4625	888	0	60	8672	4229
0677	4229	888	0	29	8008	4434
0678	4434	888	0	60	8673	4238
0679	4238	888	0	29	8009	4243
0680	4243	888	0	60	8674	4047
0681	4047	888	0	29	8010	4202
0682	4202	888	0	60	8675	4206
0683	4206	888	0	29	8011	4611
0684	4611	888	0	60	8676	4415
0685	4415	888	0	29	8012	4070
0686	4070	888	0	60	8677	4424
0687	4424	888	0	29	8013	4429
0688	4429	888	0	60	8678	4433
0689	4433	888	0	25	8701	4037
0690	4037	888	0	37	0500	4245
0691	4245	888	0	20	8703	4049
0692	4049	888	0	60	82FG	4053
0693	4053	888	0	25	8704	4057
0694	4057	888	0	06	4610	4610
0695	4610	888	0	32	0500	4018
0696	4018	888	0	20	8702	4222
0697	4222	888	0	60	83FG	4026
0698	4026	888	0	35	4028	4630
0699	4630	888	0	70	000A	4235
0700	4235	888	0	70	000A	4440
0701	4440	888	0	20	82FG	4444
0702	4444	888	0	60	84FG	4448
0703	4448	888	0	29	8003	4253
0704	4253	888	0	06	4406	4406

&ST

STA2	30001	
BUF2	30000	
STA2	A	
LDA1	8002	
SHL	0400	
ERS#	00HHH	00000
BUF2	AH	
STA2	AH	
IIR1	0002	
IIR2	0002	
ADD		-ST
CON	99999	40000
HHH		H
LDA1	8004	
STA	R0000	
LDA1	8005	
BUF#	80000	00000
STA	R0001	
LDA1	8006	
STA	R0002	
LDA1	8007	
STA	R0003	
LDA1	8008	
STA	R0004	
LDA1	8009	
STA	R0005	
LDA1	8010	
STA	R0006	
LDA1	8011	
STA	R0007	
LDA1	8012	
STA	R0008	
LDA1	8013	
STA	R0009	
LDA	30002	
SHL	0500	
BUF	30004	
STA	MCN	
LDA	30005	
CLX		
SHR	0500	
BUF	30003	
STA	MCZ	
ERS#	11111	11111
ADD	RA	
ADD	RA	
BUF	MCN	
STA	MC	
LDA1	8003	
CLX		

E4. MOVE COMMENTS

E5. CONSTRUCT CONSTANTS

E6. EDIT OP CODE.

0705	4406	888	0	32	0700	4216	SHR	0700		
0706	4216	888	0	30	000A	4270	LDL	RA		
0707	4270	888	0	29	8002	4075	LDA1	8002		
0708	4075	888	0	32	0700	4435	SHR	0700		
0709	4435	888	0	37	0500	4443	SHL	0500		
0710	4443	888	0	20	0008	4247	BUF	RL		
0711	4247	888	0	20	4249	4401	BUF#	88000	88000	
0712	4401	888	0	60	85FG	4055	STA	OP		
0713	4055	888	0	65	86FG	4209	STX	IR		
0714	4209	888	0	06	0014	4213	IIR1	0014	2F	
0715	4213	888	0	60	87FG	4017	STA	TAPE1		E7. INPUT BUFFER EMPTY
0716	4017	888	0	29	8000	4422	LDA1	8000		
0717	4422	888	0	31	4275	4275	CLL			
0718	4275	888	0	82	4228	4428	TEQ	6F		
0719	4428	888	0	09	8001	4633	LDX1	8001		
0720	4633	888	0	30	000C	3919	LDL	RX	TSUB*	E8. SWAP BUFFERS
0721	8201	888	0	G2	0300	4218	TRD	ITAP1		
0722	4218	888	0	08	0201	4221	LIR1	0201		
0723	4221	888	0	25	4223	4475	LDA	TCON1	1F	
0724	4223	888	0	F6	8001	4453	TBU	50000	-5	
0725	4454	888	0	67	8888	4453	HLT	8888	-5	
0726	4453	888	0	60	8200	4257	STA	50199	3F	
0727	8402	888	0	G2	0300	4019	TRD	ITAP1		
0728	4019	888	0	08	0000	4622	LIR1	0000		
0729	4622	888	0	25	4624	4475	LDA	TCON2	1F	
0730	4624	888	0	F6	8202	4653	TBU	60000	-6	
0731	4654	888	0	67	8888	4653	HLT	8888	-6	
0732	4653	888	0	60	8401	4257	STA	60199	3F	
0733	4257	888	0	31	4060	4060	CLL	3F		
0734	4475	888	0	60	88FG	4629	STA	TCONT		
0735	4629	888	0	0G	0000	4083	IIR1	0000		
0736	4083	888	0	60	87FG	4228	STA	TAPE1	6F	
0737	8919	888	0	50	80FH	4423	STL	TEX1		TAPE SUBROUTINE. RL IS EXIT; RX IS TAPE INST.
0738	4423	888	0	65	81FH	4027	STX	TEX	1F	WAIT UNTIL PREV TAPE INSTRUCTION CLEARS.
0739	4027	888	0	C7	4432	4027	TBT		*	
0740	4432	888	0	26	4635	4635	CLA			
0741	4635	888	0	82	4438	4638	TEQ	2F		
0742	4638	888	0	25	89FG	4242	LDA	LTAPE		
0743	4242	888	0	67	2222	000A	HLT	2222	RA	HALT IF INDICATOR LIGHT ON
0744	4438	888	0	25	88FG	4442	LDA	TCONT		
0745	4442	888	0	31	4445	4445	CLL			IF PRECEDING WAS A READ; UNLOAD BUFFER
0746	4445	888	0	82	4060	000A	TEQ	3F	RA	PUT NEXT TAPE INSTRUCTION INTO LTAPE
0747	4060	888	0	50	88FG	4402	STL	TCONT		
0748	4402	888	0	25	81FH	4606	LDA	TEX		
0749	4606	888	0	35	4408	4260	ERS#	HHHHH	H0000	
0750	4260	888	0	20	4612	4214	BUF		8F	
0751	4612	888	0	00	0000	4027	JMP	0000	1B	
0752	4214	888	0	60	89FG	80FH	STA	LTAPE	TEX1	
0753	4228	888	0	30	85FG	4632	LDL	OP		E9. OP SRCH*.
0754	4632	888	0	25	4634	4636	LDA#	88220	88658	

E7. INPUT BUFFER EMPTY

E8. SWAP BUFFERS

TAPE SUBROUTINE. RL IS EXIT; RX IS TAPE INST.

WAIT UNTIL PREV TAPE INSTRUCTION CLEARS.

HALT IF INDICATOR LIGHT ON

IF PRECEDING WAS A READ; UNLOAD BUFFER

PUT NEXT TAPE INSTRUCTION INTO LTAPE

E9. OP SRCH\*.

0755	4636	888	0	82	4239	4439
0756	4056	888	1	08	0006	4409
0757	4409	888	0	05	4061	4413
0758	4413	888	0	25	4615	4712
0759	4615	888	0	30	4219	8736
0760	4219	888	0	25	4623	4675
0761	4675	888	0	64	2000	4061
0762	4061	888	0	30	4613	4065
0763	4065	888	0	87	4418	000A
0764	4418	888	0	60	85FG	4072
0765	4072	888	0	30	4074	4226
0766						

ONSW

1

TEQ	ONN	SWICH
LIR3	0006	
LDX	1F	
LOA		SRCH*
LDL		ERR1*
LDAN	67220	00000
STA1	ETAB	1F
LDL#	CCCCC	CCCCC
TGR		RA
STA	OP	
LDL	PROCM	PROCA
HHH		H

0767	4226	888	1	08	0000	4079
0768	4079	888	0	50	82FH	4283
0769	4283	888	0	25	8706	4237
0770	4237	888	0	30	4639	4241
0771	4241	888	0	82	4644	4094
0772	4094	888	0	31	4447	4447
0773	4447	888	0	25	84FC	4601
0774	4601	888	0	82	4644	4204
0775	4204	888	0	30	4644	8736
0776	4644	888	0	05	4648	4600
0777	4600	888	0	30	4602	8810
0778	4602	888	1	00	4010	4010
- 0779	4010	888	1	02	0002	4012
- 0780	4011	888	1	02	0002	4012
0781	4012	888	0	30	4014	8736
0782	4013	888	0	25	81FG	4217
- 0783	4014	888	0	25	81FG	4217
- 0784	4015	888	0	25	81FG	4217
0785	4217	888	0	30	4419	8723
0786	4419	888	0	30	4648	8861
0787	4648	888	0	60	85FC	4404
0788	4404	888	0	30	86FC	4608
0789	4608	888	0	82	4261	4461
0790	4461	888	0	30	87FC	4265
0791	4265	888	0	82	4618	4068
0792	4618	888	0	25	85FH	4272
0793	4261	888	0	30	87FC	4465
0794	4465	888	0	25	4417	4619
0795	4417	888	1	00	0000	0000
0796	4619	888	0	70	0008	4274
0797	4274	888	0	82	4227	4618
0798	4227	888	0	25	84FH	4272
0799	4272	888	0	60	83FH	4426
0800	4426	888	0	31	4279	4279
0801	4279	888	0	50	84FC	82FH
0804	4068	888	0	25	4470	4472
0805	4470	888	1	00	0000	0000
0806	4472	888	0	70	85FC	4272

PROCA

LIR3	0000
STL	AEX
LDA	A
LDL#	00000
TEQ	1F
CLL	
LDA	BLANK
TEQ	1F
LDL	1F
LDX	2F
LDL	
JMP2	L0000
LIR2	0002
LIR2	0002
LDL	L0004
LDA	LINE
LDA	LINE
LDA	LINE
LDL	
LDL	2F
STA	ALOC
LDL	MLOC
TEQ	3F
LDL	CLOC
TEQ	4F
LDA	CLEV
LDL	CLOC
LDA	
CON1	00000
ADD	RL
TEQ	
LDA	MLEV
STA	ALEV
CLL	
STL	BLANK
LDA	
CON1	00000
ADD	ALOC

88888

ERR1\*

FIND\*

L0002

L0002

ERR1\*

1F

1F

1F

FARB\*

DEFN\*

L. PROCESS A ADDRESS.

L1. CHECK BLANK A

L2. FIND\* A.

L3. FARB\*,DEFN\*.

L4. ADJUST A LEVEL.

L5. ZERO TO BLANK.

AEX

8F

00000

1B

0807	4074	888	0	25	B6FG	4628
0808	4628	888	0	30	4080	4082
0809	4082	888	0	82	4085	4285
0810	4285	888	0	30	4437	4089
0811	4089	888	0	82	4085	4642
0812	4642	888	0	25	B3FH	4046
0813	4046	888	0	70	4098	4051
0814	4051	888	0	60	B3FH	4085
0815	4085	888	0	25	B5FG	4289
0816	4289	888	0	32	0200	4294
0817	4294	888	0	35	4246	4298
0818	4298	888	0	70	B3FH	4103
0819	4103	888	0	60	B9FH	4457
0820	4457	888	1	08	0002	4460
0821	4460	888	0	25	B6FG	4414
0822	4414	888	0	30	4416	4268
0823	4268	888	0	82	4421	4621
0824	4621	888	0	37	0200	4626
0825	4626	888	0	31	4479	4479
0826	4479	888	0	06	4282	4282
0827	4282	888	0	70	4084	000A
0828	4084	888	0	25	4000	4052
0829	4000	888	0	00	0000	0000
0830	4001	888	0	40	0000	0000
0831	4002	888	0	00	0000	0001
0832	4003	888	0	40	0000	0001
0833	4004	888	0	00	0000	0002
0834	4005	888	0	00	0000	0003
0835	4006	888	0	00	0000	0005
0836	4007	888	0	00	0000	0006
0837	4008	888	0	00	0000	0007
0838	4009	888	0	00	0000	0008
0839	4052	888	0	60	B9FC	4256
0840	4256	888	0	32	0100	4660
0841	4660	888	0	20	B5FG	4614
0842	4614	888	0	60	B5FG	4468
0843	4421	888	0	25	B9FH	4125
0844	4125	888	0	30	4427	8723
0845	4427	888	0	60	B6FC	4483
0846	4483	888	0	30	4485	8871
0847	4485	888	0	60	B4FH	4441
0848	4441	888	0	25	B6FC	4645
0849	4645	888	0	32	0800	4456
0850	4456	888	0	25	B0FG	4110
0851	4110	888	0	35	4062	4064
0852	4064	888	0	32	0200	4069
0853	4069	888	0	25	B4FG	4073
0854	4073	888	0	30	4325	8900
0855	4325	888	0	25	4679	4431

PROCM

1

3

4

5

LDA	IR	
LDL#	00000	00800
TEQ	1F	
LDL#	10000	00H00
TEQ	1F	
LDA	ALEV	
ADD#	00000	00001
STA	ALEV	1F
LDA	OP	
SHR	0200	
ERS#	00000	000HH
ADD	ALEV	
STA	OPTIM	
LIR3	0002	
LDA	IR	
LDL#	10000	00H00
TEQ	5F	
SHL	0200	
CLL		
CLX		
ADD	3F	RA
LDA	00000	4F
CON	00000	00000
CON	40000	00000
CON	00000	00001
CON	40000	00001
CON	00000	00002
CON	00000	00003
CON	00000	00005
CON	00000	00006
CON	00000	00007
CON	00000	00008
STA	SIGN	
SHR	0100	
BUF	OP	
STA	OP	PRCM1
LDA	OPTIM	
LDL		FARB*
STA	MLOC	
LDL		AJST*
STA	MLEV	
LDA	MLOC	
SHR	0800	
LDA	R	
ERS#	00000	000H0
SHR	0200	
LDA	MC	
LDL		OTPT*
LDAN	00000	88888

P. PROCESSING OF INSTRUCTIONS

P1. PROCESS A

P2. CALCULATE M OPTIM

P3. LITERAL

P4. FIGURE INDEXING

P5. CREATE CONSTANT

0856	4431	888	0	60	8710	4685
0857	4468	888	0	05	4670	4672
0858	4672	888	0	30	4474	8810
0859	4474	888	0	31	4129	4129
0860	4129	888	1	00	4020	4020
0861	4022	888	0	25	85FG	4076
0862	4076	888	0	35	4078	4280
0863	4280	888	0	82	4021	4683
0864	4683	888	0	25	85FC	4670
0865	4020	888	0	30	4122	8736
0866	4023	888	0	30	4122	8736
0867	4122	888	0	26	4670	4670
0868	4025	888	0	25	89FH	4329
0869	4024	888	0	25	89FH	4329
0870	4021	888	0	25	89FH	4329
0871	4329	888	0	30	4631	8723
0872	4631	888	0	30	4670	8861
0873	4670	888	0	60	86FC	4276
0874	4276	888	0	30	4278	8871
0875	4278	888	0	60	84FH	4689
0876	4685	888	0	25	85FG	4489
0877	4489	888	0	35	4641	4643
0878	4643	888	0	70	4095	4498
0879	4095	888	0	99	7000	0000
0880	4499	888	0	25	86FC	4303
0881	4303	888	0	30	4255	4657
0882	4657	888	0	82	4310	4510
0883	4310	888	0	25	4262	4510
0884	4262	888	0	00	0000	1000
0885	4510	888	0	06	4063	4063
0886	4063	888	0	32	0200	4668
0887	4668	888	0	70	85FG	4273
0888	4273	888	0	60	85FG	4477
0890	4498	888	0	30	4251	4503
0891	4503	888	0	82	4656	4106
0892	4656	888	0	25	85FG	4710
0893	4710	888	0	35	4462	4264
0894	4462	888	0	00	0000	HHHH
0895	4106	888	0	70	4058	4476
0896	4058	888	0	00	1000	0000
0897	4477	888	0	30	83FH	4081
0898	4476	888	0	30	84FH	4081
0899	4081	888	0	25	85FG	4135
0900	4135	888	0	35	4637	4689
0901	4689	888	0	70	0008	4264
0902	4264	888	0	60	89FH	4118
0903	4118	888	1	08	0004	4071
0904	4071	888	0	05	4473	4525
0905	4525	888	0	30	4627	8810
0906	4627	888	1	00	4030	4030

PRCM1	STA	C	PROCC
	LDX	2F	
	LDL		FIND*
	CLL		
M0002	JMP2	M0000	
	LDA	OP	
	ERS#	00020	00000
	TEQ	M0001	
	LDA	ALOC	2F
M0000	LDL	1F	ERR1*
M0003	LDL	1F	ERR1*
1	CLA	2F	
M0005	LDA	OPTIM	1F
M0004	LDA	OPTIM	1F
M0001	LDA	OPTIM	1F
1	LDL		FARB*
	LDL	2F	DEFN*
2	STA	MLOC	
	LDL		AJST*
	STA	MLEV	PROCC
PROCC	LDA	OP	
	ERS#	00H00	00000
	ADD		-C1
	CON	99700	00000
8C1	LDA	MLOC	
	LDL#	00000	00F00
	TEQ		1F
	LDA		1F
	CON	00000	01000
1	CLX		
	SHR	0200	
	ADD	OP	
	STA	OP	8C2
-C1	LDL#	99800	00000
	TEQ		3F
	LDA	OP	
	ERS		2F
	CON	00000	0HHHH
3	ADD		-C2
	CON	00100	00000
8C2	LDL	ALEV	3F
-C2	LDL	MLEV	3F
3	LDA	OP	
	ERS#	00000	000HH
	ADD	RL	2F
2	STA	OPTIM	
	LIR3	0004	
	LDX	2F	
	LDL		FIND*
	JMP2	C0000	

P6. FIND\* M.

P7. FARB\*, DEFN\*.

P8. ADJUST M LEVEL

P9. CALCULATE C OPTIM

P10. FIND\* C.



0907	4033	888	0	30	4335	8736	C0003	LDL	1F	ERR1*	P11.FARB*,DEFN*.
0908	4030	888	0	30	4335	8736	C0000	LDL	1F	ERR1*	
0909	4335	888	0	26	4473	4473	1	CLA	2F		
0910	4032	888	0	25	85FG	4086	C0002	LDA	OP		
0911	4086	888	0	35	4088	4640		ERS#	00010	00000	
0912	4640	888	0	31	4093	4093		CLL			
0913	4093	888	0	82	4446	4646		TEQ	1F		
0914	4646	888	0	25	86FC	4473		LDA	MLOC	2F	
0915	4446	888	0	07	0010	4449	1	IIR	0010		
0916	4449	888	0	70	88AH	4604		ADD	FUNNY		
0917	4604	888	0	30	4306	4258		LDL#	00199	00000	
0918	4258	888	0	87	4031	4661		TGR	C0001		
0919	4661	888	0	60	88AH	4665		STA	FUNNY		
0920	4665	888	0	05	000A	4269		LDX	RA		
0921	4269	888	0	70	4271	4724		ADD		-FNNY	
0922	4271	888	0	99	9000	0000		CON	99900	00000	
0923	4725	888	0	20	4077	4529	&FNNY	BUF		1F	
0924	4077	888	0	00	800F	0000		CON	00800	F0000	
0925	4724	888	0	07	800A	4277	-FNNY	IIR	800A		
0926	4277	888	0	20	000C	4529		BUF	RX	1F	
0927	4529	888	0	32	0400	4286	1	SHR	0400	3F	
0928	4035	888	0	25	89FH	4139	C0005	LDA	OPTIM	1F	
0929	4034	888	0	25	89FH	4139	C0004	LDA	OPTIM	1F	
0930	4031	888	0	25	89FH	4139	C0001	LDA	OPTIM	1F	
0931	4139	888	0	30	4286	8723	1	LDL	3F	FARB*	
0932	4286	888	0	30	4473	8861	3	LDL	2F	DEFN*	
0933	4473	888	0	60	87FC	4729	2	STA	CLOC		P12.ADJUST C LEVEL
0934	4729	888	0	30	4281	8871		LDL		AJST*	
0935	4281	888	0	60	85FH	4087		STA	CLEV	BUILD	
0936	4087	888	0	25	87FC	4091	BUILD	LDA	CLOC		P13. SYNTHESIZE
0937	4091	888	0	32	0400	4698		SHR	0400		
0938	4698	888	0	25	86FC	4252		LDA	MLOC		
0939	4252	888	0	32	0600	4111		SHR	0600		
0940	4111	888	0	25	85FG	4115		LDA	OP		
0941	4115	888	0	35	4617	4469		ERS#	HH000	00000	
0942	4469	888	0	20	000C	4673		BUF	RX		
0943	4673	888	0	77	4673	4676		ATL		BILD1	
0944	4676	888	0	25	85FC	4480	BILD1	LDA	ALOC		P14.ASSEMBLE
0945	4480	888	0	06	4133	4133		CLX			
0946	4133	888	0	32	0500	4291		SHR	0500		
0947	4291	888	0	25	89FC	4295		LDA	SIGN		
0948	4295	888	0	32	0200	4050		SHR	0200		
0949	4050	888	0	25	80FG	4054		LDA	R		
0950	4054	888	0	32	0300	4160		SHR	0300		
0951	4160	888	0	25	0008	4464		LDA	RL		
0952	4464	888	0	30	4616	8900		LDL		OTPT*	
0953	4616	888	0	25	84FB	4322		LDA	TEMP1	1F	P15.EDIT
0954	4322	888	0	05	4674	8920	1	LDX		UNDG*	
0955	4674	888	0	65	84FB	4680		STX	TEMP1		
0956	4680	888	0	06	4333	4333		CLX			

0957	4333	888	0	32	0400	4090
0958	4090	888	0	37	0200	4495
0959	4495	888	0	32	0600	4254
0960	4254	888	0	65	0255	4107
0961	4107	888	0	37	0200	4662
0962	4662	888	0	60	83FB	4066
0963	4066	888	0	25	85FB	4120
0964	4120	888	0	05	4522	8920
0965	4522	888	0	65	85FB	4478
0966	4478	888	0	77	4478	4481
0967	4481	888	0	35	4533	4535
0968	4535	888	0	20	83FB	4339
0969	4339	888	0	60	0370	4722
0970	4722	888	0	25	0008	4126
0971	4126	888	0	35	4678	4130
0972	4130	888	0	37	0200	4735
0973	4735	888	0	60	0286	4288
0974	4288	888	0	25	85FB	4092
0975	4092	888	0	35	4494	4096
0976	4096	888	0	37	0200	4451
0977	4451	888	0	20	4703	4455
0978	4455	888	0	60	0281	4733
0979	4733	888	0	25	85FB	4287
0980	4287	888	0	35	4539	4491
0981	4491	888	0	77	4491	4694
0982	4694	888	0	25	84FB	4148
0983	4148	888	0	06	4651	4651
0984	4651	888	0	32	0400	4458
0985	4458	888	0	37	0200	4263
0986	4263	888	0	32	0600	4172
0987	4172	888	0	37	0200	4677
0988	4677	888	0	20	0008	4681
0989	4681	888	0	20	4183	4185
0990	4185	888	0	60	0365	4067
0991	4067	888	0	25	000C	4471
0992	4471	888	0	20	4123	4175
0993	4175	888	0	60	0250	4452
0994	0205	888	0	00	0000	0000
0995	83AG	888	0	06	4669	4669
0996	4669	888	0	63	4669	4372
0997	4372	888	0	60	0250	4652
0998	4652	888	0	65	0255	4307
0999	4307	888	0	60	0281	4383
1000	4383	888	0	65	0286	4488
1001	4488	888	0	60	0365	4267
1002	4267	888	0	65	0370	4452
1003	4452	888	0	31	4655	4655
1004	4655	888	0	25	87FH	4609
1005	4609	888	0	82	4112	4312
1006	4112	888	0	25	8678	4266

0205  
PSUDX

ALLX

FIN

SHR	0400	
SHL	0200	
SHR	0600	
STX	0255	
SHL	0200	
STA	TEMP	
LDA	TEMP2	
LDX		UNOG*
STX	TEMP2	
ATL		
ERS#	HHHHH	H0000
BUF	TEMP	
STA	0370	
LDA	RL	
ERS#	00000	OHHHH
SHL	0200	
STA	0286	
LDA	TEMP2	
ERS#	00000	OHHHH
SHL	0200	
BUF#	BBBBB0	000BB
STA	0281	
LDA	TEMP2	
ERS#	HHHHH	H0000
ATL		
LDA	TEMP1	
CLX		
SHR	0400	
SHL	0200	
SHR	0600	
SHL	0200	
BUF	RL	
BUF#	00080	B00BB
STA	0365	
LDA	RX	
BUF#	00008	B0000
STA	0250	ALLX
CON	00000	00000
CLX		
ZAP		
STA	0250	
STX	0255	
STA	0281	
STX	0286	
STA	0365	
STX	0370	ALLX
CLL		
LDA	FTAG	
TEQ	FIN	FLOW
LDA	R0009	

P16.FLOW CHART

1007	4266	888	0	05	8677	4320
1008	4320	888	0	60	0262	4664
1009	4664	888	0	65	0267	4119
1010	4119	888	0	25	8674	4323
1011	4323	888	0	05	8673	4127
1012	4127	888	0	60	0294	4296
1013	4296	888	0	65	0299	4101
1014	4101	888	0	25	8670	4105
1015	4105	888	0	05	8669	4059
1016	4059	888	0	60	0325	4327
1017	4327	888	0	65	0330	4482
1018	4482	888	0	25	8676	4486
1019	4486	888	0	05	8675	4290
1020	4290	888	0	60	0378	4330
1021	4330	888	0	65	0383	4385
1022	4385	888	0	25	8672	4739
1023	4739	888	0	05	8671	4293
1024	4293	888	0	60	0209	4311
1025	4311	888	0	65	0214	4466
1026	4466	888	0	25	86FB	4520
1027	4520	888	0	06	4523	4523
1028	4523	888	0	62	4523	4527
1029	4527	888	0	37	0400	4284
1030	4284	888	0	20	81FG	4688
1031	4688	888	0	20	4490	4292
1032	4292	888	0	60	0200	4102
1033	4102	888	0	25	82AC	4506
1034	4506	888	0	70	4658	4511
1035	4658	888	0	99	9999	9951
1036	4511	888	0	75	4114	4467
1037	4467	888	0	60	82AC	4671
1038	4671	888	0	11	0201	4189
1039	4512	888	0	60	82AC	4666
1040	4666	888	0	11	0217	4189
1041	4190	888	0	67	3333	000A
1042	4189	888	0	25	87FG	4493
1043	4493	888	0	70	4695	000A
1044	4695	888	0	08	0000	4200

LDX	R0008	
STA	0262	
STX	0267	
LDA	R0005	
LDX	R0004	
STA	0294	
STX	0299	
LDA	R0001	
LDX	R0000	
STA	0325	
STX	0330	
LDA	R0007	
LDX	R0006	
STA	0378	
STX	0383	
LDA	R0003	
LDX	R0002	
STA	0209	
STX	0214	
LDA	ERROR	
CLX		
ZUP		
SHL	0400	
BUF	LINE	
BUFN	00000	80000
STA	0200	
LDA	LC	
ADD		-PR
CON	99999	99951
SUB#	99999	99950
STA	LC	
PRN	0201	-PR1
STA	LC	
PRN	0217	-PR1
HLT	3333	RA
LDA	TAPE1	
ADD		RA
LIR1	0000	START

P17. PRINT

1045  
1046  
1047  
1048  
1049  
1050  
1051  
1052  
1053  
1054  
1055  
1056  
1057  
1058  
1059  
1060  
1062  
1063  
1064  
1065  
1066  
1067  
1068  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079  
1080  
1081  
1082  
1083  
1084  
1085  
1086  
1087  
1088  
1089  
1090  
1091  
1092  
1093  
1094

85AG	888	0	25	8709	4720
4720	888	0	60	86FH	83AG
86AG	888	0	25	4318	4170
4170	888	0	67	1212	4712
4712	888	0	60	87FH	83AG
81AH	888	0	25	82FG	4572
82AH	888	0	25	83FG	4572
84AH	888	0	25	8708	4572
4572	888	0	60	84FG	80AH
80AH	888	0	30	4128	4530
4128	888	0	30	4730	4226
4730	888	0	30	84FG	4676
4530	888	0	50	80FB	4484
4484	888	0	25	86FG	4138
4138	888	0	30	4690	4492
4492	888	0	82	4145	4345
4345	888	0	32	0200	4145
4145	888	0	60	89FC	80FB
80AG	888	2	02	0000	4319
81AG	888	2	02	0003	4319
4319	888	0	25	8711	4723
4723	888	0	30	4375	4727
4727	888	0	82	4180	4380
4380	888	0	35	4682	4684
4684	888	0	37	0400	4691
4180	888	0	07	0001	4691
4691	888	0	77	4691	4144
4144	888	0	20	4496	4348

MMH  
FLO  
  
NUM  
ZON  
ALF  
1  
CON  
  
PSIGN  
  
  
1  
BLA  
BLR  
1  
  
  
1  
2

LDA	MM	
STA	HTAG	PSUDX
LDAN	HHHHH	HHHHH
HLT	1212	
STA	FTAG	PSUDX
LDA	MCN	1F
LDA	MCZ	1F
LDA	N	1F
STA	MC	CON
LDL		PSIGN
LDL		PROCA
LDL	MC	BILD1
STL	EXIT	
LDA	IR	
LDL#	00000	00800
TEQ	1F	
SHR	0200	1F
STA	SIGN	EXIT
LIR4	0000	1F
LIR4	0003	1F
LDA	CH	
LDL#	00000	00888
TEQ	1F	
ERS#	00000	000HH
SHL	0400	2F
IIR	0001	2F
ATL		
BUF	BVAR1	

C. CONTROL OPS.  
C1. BRANCH TO OP  
RA CONTAINS A TRANSFER TO CONTROL OP.  
FROM STEP E9.

OPERATOR SHOULD CLEAR A IF FLOWCHARTING  
IS NOT DESIRED.  
C2. PROCESS A

C3. UPDATE AVAIL TABLE

1095	4348	888	0	60	4450	4302
1096	4302	888	0	25	0008	4706
1097	4706	888	0	06	4259	4259
1098	4259	888	0	32	0400	4116
1099	4116	888	0	75	4518	4121
1100	4121	888	0	60	84FB	4575
1101	4575	888	0	05	4177	4179
1102	4179	888	1	08	0002	4132
1103	4177	888	0	60	86FC	4131
1104	4131	888	0	25	8710	4585
1105	4585	888	0	30	4487	4389
1106	4389	888	0	82	4692	4142
1107	4692	888	0	26	4545	4545
1108	4142	888	1	08	0004	4745
1109	4745	888	0	05	4647	4132
1110	4132	888	0	30	4134	8910
1111	4647	888	0	75	86FC	4545
1112	4545	888	0	60	85FB	4649
1113	4649	888	0	25	86FC	4153
1114	4153	888	0	30	000A	4507
1115	4507	888	0	85	4459	4686
1116	4686	888	0	60	83FB	4140
1117	4140	888	0	26	4693	4693
1118	4693	888	0	32	0400	4650
1119	4650	888	0	25	000C	4104
1120	4104	888	0	70	000A	4659
1121	4659	888	0	35	4711	4463
1122	4463	888	0	20	4315	000A
1123	4315	888	0	08	0000	4370
1124	4370	888	0	26	4173	4173
1125	4173	888	0	75	83FB	4328
1126	4328	888	0	37	0300	4334
1127	4334	888	0	35	4136	4338
1128	4338	888	0	75	4340	000A
1129	4340	888	0	02	0000	4195
1130	4195	888	0	25	83FB	4099
1131	4099	888	0	37	0600	4108
1132	4108	888	0	35	4360	4162
1133	4162	888	0	20	4314	4316
1134						
1135	4316	888	0	77	4316	8965
1136	8965	888	2	00	8403	8403
1137	8403	888	1	25	8409	8966
1138	8406	888	1	25	8413	8966
1139	8404	888	0	00	0000	0000
1140	8407	888	0	HH	HHHH	HHHH
1141	8966	888	2	05	8404	0008
1142	4314	888	0	32	0000	8967
1143	8967	888	0	60	82FC	8968
1144	8968	888	2	30	8405	8969

1  
FP2ER

2

1

FPERR

2

3

7

0

B0000

B0003

B0001

B0004

2

1

7

STA	BVAR	
LDA	RL	
CLX		
SHR	0400	
SUB#	00000	00001
STA	TEMP1	1F
LDX	2F	FP2ER
LIR3	0002	FPERR
STA	MLOC	
LDA	C	
LDL#	00000	88888
TEQ		1F
CLA	3F	
LIR3	0004	
LDX	2F	FPERR
LDL	PERR	FIND*
SUB	MLOC	3F
STA	TEMP2	
LDA	MLOC	7F
LDL	RA	
MUL#	00000	0A005
STA	TEMP	
CLA		
SHR	0400	
LDA	RX	
ADD	RA	
ERS#	00HHH	H0000
BUF		RA
LIR1	0000	
CLA		
SUB	TEMP	
SHL	0300	
ERS#	00000	30000
SUB		RA
LIR	0000	
LDA	TEMP	
SHL	0600	
ERS#	000H0	00000
BUF	1F	
HHH		C
ATL		0F
JMP4	B0000	
LDA2	B0006	2F
LDA2	B0010	2F
CON	00000	00000
CON	HHHHH	HHHHH
LDX4	B0001	RL
SHR	0000	7F
STA	MASK	
LDL4	B0002	-B2

1145	8969	888	0	29	8418	0008
1146	8405	888	0	20	82FC	8971
1147	8408	888	0	35	82FC	8971
1148	8409	888	0	50	0000	0000
1149	8410	888	0	40	0000	0000
1150	8411	888	0	20	0000	0000
1151	8412	888	0	10	0000	0000
1152	8413	888	0	CH	HHHH	HHHH
1153	8414	888	0	8H	HHHH	HHHH
1154	8415	888	0	FH	HHHH	HHHH
1155	8416	888	0	GH	HHHH	HHHH
1156	8971	888	0	64	8418	8972
1157	8972	888	0	25	85FB	8973
1158	8973	888	0	75	84FB	8974
1159	8974	888	0	70	8975	8976
1160	8975	888	0	99	9999	9999
1161	8977	888	0	60	85FB	4450
1162	4496	888	0	06	0000	8978
1163	8978	888	0	70	8979	8969
1164	8979	888	0	99	9800	0000
1165	8970	888	0	20	8980	000A
1166	8980	888	0	08	0000	8981
1167	8981	888	0	25	82FC	8982
1168	8982	888	0	30	000C	8983
1169	8983	888	0	32	0100	8984
1170	8984	888	0	82	8985	8967
1171	8985	888	1	07	0001	8986
1172	8986	888	0	30	8967	8965
1173						
1174	84AG	888	0	05	4718	4179
1175	4718	888	0	60	86FC	8976
1176	4134	888	0	30	83AG	8736
1177	82AG	888	0	25	83FC	4570
1178	4570	888	0	70	4772	4775
1179	4775	888	0	06	4528	4528
1180	4528	888	0	32	0400	4785
1181	4785	888	0	20	4687	4589
1182	4589	888	0	60	86FC	4143
1183	4143	888	0	05	4395	4179
1184	4395	888	0	37	0400	4502
1185	4502	888	0	70	83FC	4707
1186	4707	888	0	05	000A	4161
1187	4161	888	0	70	4663	4516
1188	4663	888	0	99	9000	0000
1189	4517	888	0	25	4169	4321
1190	4321	888	0	05	4134	8760
1191	4516	888	0	65	83FC	8976
1192	8976	888	1	08	0000	4373
1193	4373	888	0	05	4134	4336
1194	4336	888	0	30	4538	8810

-B2	LDA1	00001	RL
80002	BUF	MASK	8F
80005	ERS	MASK	8F
80006	CON	50000	00000
80007	CON	40000	00000
80008	CON	20000	00000
80009	CON	10000	00000
80010	CON	CHHHH	HHHHH
80011	CON	8HHHH	HHHHH
80012	CON	FHHHH	HHHHH
80013	CON	GHHHH	HHHHH
8	STA1	00001	
	LDA	TEMP2	
	SUB	TEMP1	
	ADD		-B1
	CON	99999	99999
&B1	STA	TEMP2	BVAR
BVAR1	IIR1	0000	
	ADD		-B2
	CON	99980	00000
&B2	BUF		RA
	LIR1	0000	
	LDA	MASK	
	LDL	RX	
	SHR	0100	
	TEQ		7B
	IIR2	0001	
	LDL	7B	0B
	HHH		H
EQU	LDX	2F	FP2ER
2	STA	MLOC	-B1
PERR	LDL	PSUDX	ERR1*
COR	LDA	CORE	
	ADD#	00000	10000
	CLX		
	SHR	0400	
	BUF#	00000	0B000
	STA	MLOC	
	LDX	2F	FP2ER
2	SHL	0400	
	ADD	CORE	
	LDX	RA	
	ADD		-B3
	CON	99900	00000
&B3	LDA#	00000	0000G
	LDX	PERR	ERR2*
-B3	STX	CORE	-B1
-B1	LIR3	0000	
	LDX	PERR	
	LDL		FIND*

C4. RESERVE CORE

C5. DEFINE ADDRESS

1195	4538	888	1	00	8688	8688		JMP2	X0000		
1196	8688	888	0	25	86FC	4097	X0000	LDA	MLOC	1F	
1197	8689	888	0	25	86FC	4097	X0001	LDA	MLOC	1F	
1198	8690	888	0	00	83AG	83AG	X0002	JMP	PSUDX		
1199											
1200	8691	888	0	25	86FC	4097	X0003	LDA	MLOC	1F	
1201	8692	888	0	25	86FC	4097	X0004	LDA	MLOC	1F	
1202	8693	888	0	00	4134	4134	X0005	JMP	PERR		
1203	4097	888	0	30	83AG	8861	1	LDL	PSUDX	DEFN*	
1204								HHH			
1205	4239	888	0	05	4056	0458	ONN	LDX	ONSW	1F	
1206	85AH	888	0	05	0470	0458	OFF	LDX	OFFSW	1F	C6. ON OFF
1207	0458	888	0	65	89FH	0462	1	STX	OPTIM		
1208	0462	888	0	05	0464	4179		LDX		FP2ER	
1209	0464	888	0	30	0466	0468		LDL	TYPE		
1210	0468	888	0	82	0471	83AG		TEQ		PSUDX	
1211	0471	888	0	30	89FH	0475		LDL	OPTIM		
1212	0475	888	0	50	4439	83AG		STL	SWICH	PSUDX	
1213	86AH	888	0	67	0008	0568	TYP	HLT	RL		
1214	0568	888	0	50	0466	0668		STL	TYPE		
1215	0668	888	0	50	0241	83AG		STL	0241	PSUDX	
1216	0470	888	0	31	0473	0473	OFFSW	CLL			
1217	0473	888	0	25	87FH	0477		LDA	FTAG		C7. ASSEMBLER OFF
1218	0477	888	0	82	0480	4189		TEQ		-PR1	
1219	0480	888	0	25	0482	0484		LDA	1F		
1220	0484	888	0	05	0486	0488		LDX	2F		
1221	0488	888	0	60	0365	0567		STA	0365		
1222	0567	888	0	65	0370	0572		STX	0370		
1223	0572	888	0	06	0575	0575		CLX			
1224	0575	888	0	63	0575	0578		ZAP			
1225	0578	888	0	60	0250	0452		STA	0250		
1226	0452	888	0	65	0255	0457		STX	0255		
1227	0457	888	0	60	0281	0483		STA	0281		
1228	0483	888	0	65	0286	4112		STX	0286	FIN	
1229	0482	888	0	88	8866	6888	1	NUM	*** 0	FF **	
1230	0486	888	0	22	2021	1022	2	ZON	*** 0	FF **	
1231								HHH			H



1232	4332	888	0	77	4332	4536
1233	4536	888	0	25	86AC	4540
1234	4540	888	0	60	87AC	4344
1235	4736	888	0	25	86AC	4344
1236	4344	888	0	70	4696	4299
1237	4299	888	0	60	86AC	4353
1238	4353	888	0	70	4305	000A
1239	4305	888	0	50	5199	000C
1240	4740	888	0	50	4342	4544
1241	4544	888	0	25	88AC	4548
1242	4548	888	0	60	82AB	4702
1243	4702	888	0	25	4304	4156
1244	4304	888	0	00	8678	8669
1245	4156	888	2	88	3400	4573
1246	4573	888	2	07	0010	4377
1247	4377	888	0	60	88AC	4331
1248	4331	888	0	70	4583	4342
1249	4583	888	0	99	9800	0000
1250	4343	888	0	60	88AC	4297
1251	4297	888	0	05	4699	4301
1252	4301	888	0	30	4553	8919
1253	4553	888	0	C6	3400	4699
1254	4699	888	0	H2	0700	4342
1255	4505	888	0	25	8669	4109
1256	4109	888	0	35	4361	4313
1257	4313	888	0	60	8669	4667
1258	4667	888	0	25	8670	4521
1259	4521	888	0	35	4773	4326
1260	4326	888	0	20	4728	4580
1261	4580	888	0	60	8670	0008
1262	4312	888	1	08	0007	4515
1263	4515	888	0	25	8670	4519
1264	4519	888	0	06	4124	4124
1265	4124	888	0	65	88FH	4178
1266	4178	888	0	32	0500	4186
1267	4186	888	0	77	4186	4789
1268	4789	888	0	25	8669	4543
1269	4543	888	0	35	4595	4497
1270	4497	888	0	20	0008	4501
1271	4501	888	0	60	80A8	4705
1272	4705	888	0	30	4157	4309
1273	4309	888	0	82	4362	4562
1274	4562	888	0	30	4514	4716
1275	4716	888	0	82	4719	4369
1276	4719	888	0	60	88FH	4324
1277	4324	888	0	30	4362	4505
1278	4369	888	0	30	4721	4524
1279	4524	888	0	82	4577	4777
1280	4577	888	0	30	4112	4505

CMPL\*

COMP\*

1

2

COMT\*

8

&COM

2

BOK

FLOW

1

ATL		
LDA	MUMI	
STA	MUML	1F
LDA	MUMI	1F
ADD#	00000	20000
STA	MUMI	2F
ADD		RA
STL	W9999	RX
STL	-COM	
LDA	COMI	
STA	RB4	
LDA		8F
JMP	R0009	R0000
TCD4	COMTS	
IIR4	0010	
STA	COMI	
ADD		-COM
CON	99980	00000
STA	COMI	
LDX	2F	
LDL		TSUB*
TBL	COMTS	2F
TWR	OTAP3	-COM
LDA	R0000	
ERS#	00000	HHHHH
STA	R0000	
LDA	R0001	
ERS#	00000	HHHHH
BUF#	88888	00000
STA	R0001	RL
LIR3	0007	
LDA	R0001	
CLX		
STX	RTAG	
SHR	0500	
ATL		
LDA	R0000	
ERS#	HHHHH	00000
BUF	RL	
STA	OK	
LDL#	00000	88888
TEQ	S3	
LDL#	03000	87888
TEQ		1F
STA	RTAG	
LDL	S3	8DK
LDL#	01000	87888
TEQ		1F
LDL	FIN	8DK

X. EXAMINE REMARKS FIELD  
CMPL\* PUTS INSTRUCTION IN RA INTO MUM CODE  
MUML IS THE LOCATION OF LAST MUM INSTR.  
COMP\* PUTS WORD IN RL INTO MUM CODE  
BUT IT ISNT REALLY AN INSTRUCTION  
EXIT IS IN RX. IN BOTH CASES.

MOVE ALL REMARKS TO THE COMMENTS TAPE  
FOR USE BY PASS 3.

BOK: BLANK OUT COLS 32-35 AND GO TO RL.

X1. WHAT OK FIELD

1281	4777	888	0	30	4379	4531
1282	4531	888	0	82	4534	4734
1283	4734	888	0	30	4386	4738
1284	4738	888	0	82	4141	4341
1285	4141	888	0	05	4534	4736
1286	4341	888	0	35	4743	4795
1287	4795	888	0	30	4697	4149
1288	4149	888	0	82	4152	4352
1289	4352	888	0	35	4504	4356
1290	4356	888	0	30	4308	4560
1291	4560	888	0	82	4513	4713
1292	4713	888	0	35	4715	4117
1293	4117	888	0	30	4569	4171
1294	4171	888	0	82	4174	4374
1295	4174	888	0	25	80AB	4378
1296	4378	888	0	35	4780	4532
1297	4532	888	0	37	0300	4188
1298	4513	888	0	25	80AB	4317
1299	4317	888	0	35	4769	4371
1300	4371	888	0	37	0200	4188
1301	4188	888	0	70	000A	4193
1302	4193	888	0	30	4146	4748
1303	4748	888	0	87	4701	4151
1304	4151	888	0	30	4362	8736
1305	4362	888	0	08	0000	4367
1306	4367	888	0	29	8670	4574
1307	4574	888	0	35	4526	4578
1308	4578	888	0	75	000A	4783
1309	4783	888	0	77	4783	4586
1310	4586	888	0	29	8670	4541
1311	4541	888	0	35	4393	4346
1312	4346	888	0	C1	4346	4349
1313	4349	888	0	70	4351	4704
1314	4704	888	0	35	0008	4508
1315	4508	888	0	77	4508	4561
1316	4561	888	0	29	8669	4166
1317	4166	888	0	70	4568	4571
1318	4571	888	0	35	0008	4726
1319	4726	888	0	31	4579	4579
1320	4579	888	0	82	4732	4182
1321	4732	888	0	0G	0002	4786
1322	4786	888	0	70	4388	4367
1323	4388	888	0	99	9990	0000
1324	4368	888	0	00	4534	4534
1325	4182	888	0	30	4184	4137
1326	4137	888	0	20	0008	4741
1327	4741	888	0	85	000A	4770
1328	4770	888	0	35	4774	4176
1329	4176	888	0	37	0600	4337
1330	4337	888	0	77	4337	4390

1	LDL#	01211	83649
	TEQ	S6	
	LDL#	03112	83123
	TEQ		1F
	LUX	S6	COMP*
1	ERS#	HOHHH	HOHHH
	LDL#	00100	80AB8
	TEQ	S4	
	ERS#	HHHHH	HHOHH
	LDL#	00010	800AB
	TEQ	1F	
	ERS#	HHHHH	HHH0H
	LDL#	00001	8000A
	TEQ		S3
	LDA	DK	
	ERS#	00000	00HH0
	SHL	0300	2F
1	LDA	DK	
	ERS#	00000	00H00
	SHL	0200	2F
2	ADD	RA	
	LDL	N	
	TGR	S2	
	LDL	S5	ERR1*
S5	LIR1	0000	-NO#
-NO#	LDA1	R0001	
	ERS#	88888	88888
	SUB	RA	
	ATL		
	LDA1	R0001	
	ERS#	66666	66666
	MTX		
	ADD#	33333	33333
	ERS	RL	
	ATL		
	LDA1	R0000	
	ADD#	33333	33333
	ERS	RL	
	CLL		
	TEQ		1F
	IIR1	0002	
	ADD		-NO#
	CON	99999	00000
	JMP	S6	
8NO#	LDL#	11111	11111
1	BUF	RL	
	MUL	RA	
	ERS#	00000	0000H
	SHL	0600	
	ATL		

X2. SCAN FOR #

1331	4390	888	0	70	4542	4546
1332	4546	888	0	60	80AC	4100
1333	4100	888	0	25	4552	4154
1334	4154	888	0	75	0008	4509
1335	4509	888	0	70	4542	4746
1336	4746	888	0	60	81AC	4300
1337	4542	888	0	32	0000	0008
1338	4300	888	0	29	8670	4155
1339	4155	888	0	09	8672	4760
1340	4760	888	0	30	4762	80AC
1341	4762	888	0	35	4366	4768
1342	4768	888	0	65	83FB	4376
1343	4376	888	0	30	4778	81AC
1344	4778	888	0	32	0100	4384
1345	4384	888	0	69	8670	4590
1346	4590	888	0	29	8669	4196
1347	4196	888	0	09	8671	4551
1348	4551	888	0	30	4753	80AC
1349	4753	888	0	35	4357	4709
1350	4709	888	0	30	4761	81AC
1351	4761	888	0	32	0100	4717
1352	4717	888	0	69	8669	4576
1353	4576	888	0	30	4779	80AC
1354	4779	888	0	35	4584	4537
1355	4537	888	0	77	4537	4790
1356	4790	888	0	25	83FB	4744
1357	4744	888	0	06	4147	4147
1358	4147	888	0	32	0500	4355
1359	4355	888	0	20	0008	4159
1360	4159	888	0	60	83FB	4163
1361	4163	888	0	25	87AC	4167
1362	4167	888	0	60	82AB	4771
1363	4771	888	2	25	5201	4354
1364	4354	888	0	70	4556	4363
1365	4556	888	0	98	0000	0000
1366	4363	888	0	25	4566	4776
1367	4776	888	0	05	4364	4332
1368	4364	888	0	30	83FB	4731
1369	4731	888	0	05	4784	4737
1370	4784	888	0	88	8880	0000
1371	4737	888	0	25	4191	4593
1372	4191	888	1	00	0000	0000
1373	4593	888	0	70	0008	4198
1374	4198	888	0	82	4751	4752
1375	4752	888	0	25	0008	4756
1376	4756	888	0	32	0100	4563
1377	4563	888	0	35	4165	4567
1378	4567	888	0	77	4567	4737
1379	4737	888	0	25	000C	4555
1380	4555	888	0	35	4557	4359

1  
2

-#

&#

1

8

2

ADD	1F	
STA	SHR1	
LDA#	00090	00000
SUB	RL	
ADD	1F	
STA	SHR2	2F
SHR	0000	RL
LDA1	R0001	
LDX1	R0003	
LDL		SHR1
ERS#	HHHHH	HHHHH
STX	TEMP	
LDL		SHR2
SHR	0100	
STX1	R0001	
LDA1	R0000	
LDX1	R0002	
LDL		SHR1
ERS#	HHHHH	HHHH0
LDL		SHR2
SHR	0100	
STX1	R0000	
LDL		SHR1
ERS#	HHHHH	00000
ATL		
LDA	TEMP	
CLX		
SHR	0500	
BUF	RL	
STA	TEMP	
LDA	MUML	
STA	RB4	
LDA4	W0001	
ADD		-#
CON	98000	00000
LDA#	09000	00000
LDX	&#	CMPL*
LDL	TEMP	
LDX		1F
CON	88888	00000
LDA		8F
CON1	00000	00000
ADD	RL	
TEQ	2F	
LDA	RL	
SHR	0100	
ERS#	0HHHH	0HHHH
ATL		1B
LDA	RX	
ERS#	00000	HHHHH

1381	4359	888	0	20	0008	4763
1382	4763	888	0	77	4763	4766
1383	4766	888	0	25	B3FB	4181
1384	4181	888	0	50	B3FB	4187
1385	4187	888	0	35	4391	4793
1386	4793	888	0	30	B9AC	4347
1387	4347	888	0	82	4500	4700
1388	4500	888	0	25	B3FB	4554
1389	4554	888	0	35	4757	4559
1390	4559	888	0	30	4714	4767
1391	4767	888	0	82	4381	4581
1392	4381	888	0	25	4387	4591
1393	4387	888	0	00	0000	000H
1394	4581	888	0	25	B3FB	4587
1395	4587	888	0	35	4791	4194
1396	4194	888	0	30	4396	4398
1397	4398	888	0	82	4754	4700
1398	4754	888	0	25	4708	4591
1399	4708	888	0	00	0000	00HH
1400	4591	888	0	35	B3FB	4596
1401	4596	888	0	37	0400	4755
1402	4755	888	0	70	000A	4164
1403	4164	888	0	60	B2AB	4781
1404	4781	888	0	77	4781	4787
1405	4787	888	0	25	4742	4394
1406	4394	888	0	70	4796	4549
1407	4549	888	0	60	4742	4594
1408	4594	888	0	70	0008	4749
1409	4749	888	0	05	B7AC	4158
1410	4158	888	0	65	B3AB	4564
1411	4564	888	3	70	5201	4358
1412	4358	888	3	60	5201	4558
1413	4558	888	0	25	4146	4598
1414	4598	888	0	70	4742	4547
1415	4547	888	2	60	5001	4534
1416	4700	888	0	30	B3FB	4758
1417	4758	888	0	05	4534	4736
1418	4534	888	0	30	4588	4192
1419	4192	888	0	25	B670	4747
1420	4747	888	0	82	4150	4350
1421	4150	888	0	25	B672	4759
1422	4759	888	0	82	4764	4350
1423	4764	888	0	25	B674	4382
1424	4382	888	0	82	4788	4350
1425	4788	888	0	25	B676	4392
1426	4392	888	0	82	4197	4350
1427	4197	888	0	25	B678	4365
1428	4365	888	0	82	4582	4350
1429	4350	888	0	30	4765	4740
1430	4765	888	0	25	4782	4592

2

3

4

2

S6

1

RUF	RL	
ATL		2F
LDA	TEMP	
STL	TEMP	
ERS#	H0000	H0000
LDL	KEY	
TEQ		2F
LDA	TEMP	
ERS#	HH00H	HH000
LDL#	00000	BB000
TEQ		3F
LDA		4F
CON	00000	0000H
LDA	TEMP	
ERS#	HH00H	HH000
LDL#	00000	BB000
TEQ		2F
LDA		4F
CON	00000	000HH
ERS	TEMP	
SHL	0400	
ADD	RA	
STA	RB4	
ATL		
LDA	SERAL	
ADD#	00000	00001
STA	SERAL	
ADD	RL	
LDX	MUML	
STX	RB5	
ADD5	W0001	
STA5	W0001	
LDA	N	
ADD	SERAL	
STA4	STOPT	S6
LDL	TEMP	
LDX	S6	COMP*
LDL#	BBBBB	BBBBB
LDA	R0001	
TEQ		1F
LDA	R0003	
TEQ		1F
LDA	R0005	
TEQ		1F
LDA	R0007	
TEQ		1F
LDA	R0009	
TEQ	2F	1F
LDL		COMT*
LDA		8F

X3. TRANSFER REMARKS

1431	4782	888	0	00	8678	8669		JMP	R0009	R0000	
1432	4592	888	0	80	0989	4582	8	TDC	Z0000	2F	
1433	4582	888	0	25	88FH	4792	2	LDA	RTAG		
1434	4792	888	0	31	4397	4397		CLL			
1435	4397	888	0	82	4112	4189		TEQ	FIN	-PR1	
1436	0989	888	0	00	0000	0000	Z0000	CON	00000	00000	
1437	0991	888	0	00	0000	0000	Z0002	CON	00000	00000	
1438	0993	888	0	00	0000	0000	Z0004	CON	00000	00000	
1439	0995	888	0	00	0000	0000	Z0006	CON	00000	00000	
1440	0997	888	0	00	0000	0000	Z0008	CON	00000	00000	
1441	0990	888	0	88	8888	8888	Z0001	CON	88888	88888	
1442	0992	888	0	88	8888	8888	Z0003	CON	88888	88888	
1443	0994	888	0	88	8888	8888	Z0005	CON	88888	88888	
1444	0996	888	0	88	8888	8888	Z0007	CON	88888	88888	
1445	0998	888	0	88	8888	8888	Z0009	CON	88888	88888	
1446								HHH			
1447	4701	888	0	60	4146	0548	S2	STA	N		X4. COMPILE 01 OP
1448	0548	888	0	70	0550	0553		ADD#	01000	00000	
1449	0553	888	0	05	0555	4332		LDX		CMPL*	
1450	0555	888	0	30	81FG	0559		LDL	LINE		
1451	0559	888	0	05	0561	4736		LDX		COMP*	
1452	0561	888	0	30	0563	4740		LDL		COMT*	
1453	0563	888	0	25	86AC	0767		LDA	MUMI		
1454	0767	888	0	60	82AB	0571		STA	RB4		
1455	0571	888	2	07	0006	0775		IIR4	0006		
1456	0775	888	0	60	86AC	0579		STA	MUMI		
1457	0579	888	0	25	0581	0583		LDA		8F	
1458	0581	888	0	00	8670	8669		JMP	R0001	R0000	
1459	0583	888	2	88	5194	0599	8	TCD4	W9994		
1460	0599	888	0	70	0401	0404		ADD#	00000	Z0002	
1461	0404	888	2	88	5196	0420		TCD4	W9996		
1462	0420	888	0	70	0422	0425		ADD#	00000	Z0002	
1463	0425	888	2	88	5198	4112		TCD4	W9998	FIN	
1464	4374	888	0	30	0576	4505	53	LDL		BDK	X5. COMPILE CONDITION
1465	0576	888	0	25	8670	0580		LDA	R0001		
1466	0580	888	0	35	0582	0584		ERS#	00000	HHHHH	
1467	0584	888	0	30	0586	0588		LDL#	00000	88888	
1468	0588	888	0	82	0591	0791		TEQ	1F		
1469	0791	888	0	25	87AC	0595		LDA	MUML		
1470	0595	888	0	60	82AB	0799		STA	RB4		
1471	0799	888	2	25	5201	0403		LDA4	W0001		
1472	0403	888	0	70	0405	0408		ADD#	01000	00000	
1473	0408	888	2	60	5201	0603		STA4	W0001		
1474	0603	888	0	70	0605	0608		ADD		-FLO	
1475	0605	888	0	97	0000	0000		CON	97000	00000	
1476	0608	888	0	25	0410	0412	-FLO	LDA		2F	
1477	0410	888	0	06	0000	0000		CON	06000	00000	
1478	0609	888	0	25	0411	0412	8FLO	LDA		2F	
1479	0411	888	0	05	0000	0000		CON	05000	00000	
1480	0591	888	0	25	0593	0412	1	LDA		2F	

1481	0593	888	0	08	0000	0000
1482	0412	888	0	05	0414	4332
1483	0414	888	0	30	80AB	0418
1484	0418	888	0	05	4362	4736
1485	4152	888	0	05	0554	0556
1486	0556	888	0	30	0558	0560
1487	0558	888	0	25	80AB	0562
1488	0562	888	0	37	0100	0566
1489	0566	888	0	35	0768	0570
1490	0570	888	0	60	89AC	0574
1491	0574	888	0	31	0577	0577
1492	0577	888	0	08	0000	0780
1493	0780	888	0	54	5001	0803
1494	0803	888	0	06	0002	0407
1495	0407	888	0	70	0409	0780
1496	0409	888	0	99	9800	0000
1497	0781	888	0	50	86AC	0585
1498	0585	888	0	50	88AC	0589
1499	0589	888	0	50	4742	0594
1500	0594	888	0	50	4146	0598
1501	0598	888	0	30	0400	0402
1502	0400	888	0	30	4112	4740
1503	0402	888	0	50	0804	0406
1504	0406	888	0	25	0808	0610
1505	0610	888	0	75	82AC	0415
1506	0415	888	0	31	0618	0618
1507	0618	888	0	50	82AC	0622
1508	0622	888	0	37	0400	0429
1509	0429	888	0	30	0431	0433
1510	0433	888	0	87	0436	0636
1511	0436	888	0	70	0438	0441
1512	0441	888	0	20	0443	0636
1513	0443	888	0	00	0040	0000
1514	0636	888	0	70	0638	000A
1515	0638	888	0	16	0000	0804
1516	0805	888	0	67	3333	000A
1517	0560	888	0	50	80FB	0564
1518	0564	888	0	31	0967	0967
1519	0967	888	0	25	86AC	0771
1520	0771	888	0	82	80FB	0774
1521	0774	888	0	30	000C	0778
1522	0778	888	0	05	0980	4736
1523	0980	888	0	25	88AC	0784
1524	0784	888	0	30	0786	0788
1525	0788	888	0	70	0590	000A
1526	0590	888	0	50	3401	3003
1527	3003	888	0	05	3005	0607
1528	0607	888	0	30	0809	8919
1529	0809	888	0	C6	3400	3005
1530	3005	888	0	H2	0700	0822

	CON	08000	00000
2	LDX		CMPL*
	LDL	DK	
	LDX	S5	COMP*
S4	LDX#	03000	00000
	LDL		TERM*
	LDA	DK	
	SHL	0100	
	ERS#	H0000	H0000
	STA	KEY	
	CLL		
	LIR1	0000	-CLR
-CLR	STL1	STOPT	
	IIR1	0002	
	ADD		-CLR
	CON	99980	00000
&CLR	STL	MUMI	
	STL	COMI	
	STL	SERAI	
	STL	N	
	LDL		PAGE*
	LDL	FIN	COMT*
PAGE*	STL	-SKIP	
	LDA#	00000	00066
	SUB	LC	
	CLL		
	STL	LC	
	SHL	0400	
	LDL#	00004	90000
	TGR		1F
	ADD#	00001	00000
	BUF		1F
	CON	00004	00000
1	ADD		RA
	PFD	0000	-SKIP
&SKIP	HLT	3333	RA
TERM*	STL	EXIT	
	CLL		
	LDA	MUMI	
	TEQ	EXIT	
	LDL	RX	
	LDX		COMP*
	LDA	COMI	
	LDL#	99999	99999
	ADD		RA
	STL	CMTS1	
	LDX	2F	
	LDL		TSUB*
	TBL	COMTS	2F
2	TWR	OTAP3	

X6. FINISH PREV SECTION

X7. INITIALIZE

SKIP TO BEGINNING OF PAGE SUBROUTINE

TERMINATE SECTION SUBROUTINE.  
RL IS THE EXIT, RX IS THE 03 OR 04 TO COMPILE  
THIS SUBROUTINE DOES WHAT IS DESCRIBED  
UNDER SUBSECTION X6.

1531	0822	888	0	08	0000	0625	
1532	0532	888	0	0G	0200	0536	1
1533	0536	888	0	30	86AC	0540	
1534	0540	888	0	87	0543	0625	
1535	0625	888	0	05	0427	0629	4
1536	0629	888	0	30	0631	8919	
1537	0631	888	0	CF	5000	0427	
1538	0427	888	0	H2	0600	0532	2
1539	0543	888	0	25	0545	0547	3
1540	0547	888	0	64	5199	0601	
1541	0601	888	0	05	3203	3205	
1542	3205	888	0	30	0807	8919	
1543	0807	888	0	CF	5000	3203	
1544	3203	888	0	H2	0600	80FB	2

LIR1	0000	4F
IIR1	0200	
LDL	MUMI	
TGR	3F	4F
LDX	2F	
LDL		TSUB*
TBL1	W9800	2F
TWR	OTAP2	1B
LDAN	99999	99999
STA1	W9999	
LDX	2F	
LDL		TSUB*
TBL1	W9800	2F
TWR	OTAP2	EXIT



1545	0745	B88	0	G2	0300	0762	BOP	TRD	ITAP1		B. BEGINNING OF ASSEMBLY
1546	0762	B88	0	C7	3167	0565		TBT		1F	B1. CHECK INPUT TAPE
1547	3167	B88	0	67	4444	0745		HLT	4444	BOP	
1548	0565	B88	0	25	4223	0975	1	LDA	TCON1		
1549	0975	B88	0	60	B8FG	0779		STA	TCONT		
1550	0779	B88	0	25	0745	0747		LDA	BOP		B2. READ BLOCK
1551	0747	B88	0	60	B9FG	0551		STA	LTAPE		
1552	0551	B88	0	05	0753	0755		LDX	1F		
1553	0755	B88	0	30	000C	B919		LDL	RX	TSUB*	
1554	0753	B88	0	G2	0300	0770	1	TRD	ITAP1		
1555	0770	B88	0	25	4624	0776		LDA	TCON2		
1556	0776	B88	0	60	B8FG	3180		STA	TCONT		
1560	3180	B88	0	30	0782	0984		LDL		1F	
1561	0782	B88	1	00	0000	0001		CON1	00000	00001	
1562	0984	B88	0	50	B1FG	0988	1	STL	LINE		
1563	0988	B88	0	31	3191	3191		CLL			
1564	3191	B88	0	50	B7FG	0795		STL	TAPE1	1F	B3. INITIALIZE
1565	B9AH	B88	0	08	0999	0671	BOP1	LIR1	0999		
1566	0671	B88	0	31	0474	0474		CLL	2F		
1567	0474	B88	0	29	1000	0602	2	LDA1	STAB		CLEAR SYMBOL TABLE IN MULTIPLE ASSEMBLY.
1568	0602	B88	0	70	0604	3007		ADD		-BOPR	
1569	0604	B88	0	12	0000	0000		CON	12000	00000	
1570	3007	B88	0	54	1000	3008	-BOPR	STL1	STAB	BOPR	
1571	3008	B88	0	0G	9999	0612	BOPR	IIR1	9999		
1572	0612	B88	0	82	0795	0474		TEQ	1F	2B	
1573	0795	B88	0	50	B3FC	3199	1	STL	CORE		
1574	3199	B88	0	50	B4FC	3603		STL	BLANK		
1575	3603	B88	0	50	B7FH	3207		STL	FTAG		
1576	3207	B88	0	50	B5AC	0611		STL	ACCUM		
1577	0611	B88	0	50	B6AC	0615		STL	MUMI		
1578	0615	B88	0	50	B2AC	0419		STL	LC		
1579	0419	B88	0	50	B3AC	0423		STL	LINE0		
1580	0423	B88	0	0B	0000	0626		LIR1	0000	-BP	
1581	0626	B88	0	54	B649	0831	-BP	STL1	10000		
1582	0831	B88	0	0G	0001	0435		IIR1	0001		
1583	0435	B88	0	70	0437	0626		ADD		-BP	
1584	0437	B88	0	99	9980	0000		CON	99998	00000	
1585	0627	B88	0	25	0829	3031	BOP	LDA		8F	
1586	0829	B88	0	00	B616	B417		JMP	00199	00000	
1587	3031	B88	0	B0	7800	0446	B	TDC	Y0000		
1588	0446	B88	0	B8	4800	0461		TCD	70000		
1589	0461	B88	0	30	0463	0465		LDL#	BGGGG	99999	
1590	0465	B88	0	50	B418	0469		STL	D0001		
1591	0469	B88	0	0B	0001	0472		LIR1	0001		
1592	0472	B88	0	30	0674	0676		LDL		-BP1	
1593	0674	B88	0	GG	GGGG	9999		CON	GGGGG	99999	
1594	0676	B88	0	54	B418	0481	-BP1	STL1	D0001		
1595	0481	B88	0	0G	0001	0485		IIR1	0001		
1596	0485	B88	0	70	0487	0676		ADD		-BP1	

1597	0487	888	0	99	9800	0000
1598	0677	888	0	30	0479	0681
1599	0681	888	0	50	86FH	0685
1600	0685	888	0	30	4056	0508
1601	0508	888	0	50	4439	0541
1602	0541	888	0	30	4201	0953
1603	0953	888	0	50	4200	0802
1604	0802	888	0	25	4189	0641
1605	0641	888	0	60	8901	0445
1606	0445	888	0	26	8902	8902

8BP1

WRITE

CON	99980
LDL#	00000
STL	HTAG
LDL	ONSW
STL	SWICH
LDL	STRT
STL	START
LDA	-PRI
STA	-OEX
CLA	AOEX

00000
00888

WRITE

B4. OUTPUT GETS LOADER

1608	87AG	888	1	08	0002	0669
1609	0669	888	0	05	0871	0673
1610	0673	888	0	30	0675	8810
1611	0675	888	0	67	000A	0871
1612	0871	888	0	20	0873	0875
1613	0875	888	0	05	0877	0679
1614	0679	888	0	30	0881	8900
1615	0881	888	0	25	85AC	0687
1616	0687	888	0	60	86F8	0491
1617	0491	888	0	25	0493	0495
1618	0495	888	0	60	4200	0502
1619	0502	888	0	25	83AG	0641
1620	0873	888	0	67	HMH	0000
1621	0493	888	0	30	0695	0402
1622	0695	888	0	30	0497	0402
1623	0497	888	0	05	0499	0501
1624	0501	888	0	30	0503	0560
1625	0503	888	0	67	89AH	0703
1626	0703	888	0	F2	0500	0500
1627	0500	888	0	31	0903	0903
1628	0903	888	0	25	87FH	0507
1629	0507	888	0	82	0510	0710
1630	0710	888	0	F2	0600	0600
1631	0600	888	0	F2	0700	0700
1632	0700	888	0	G2	0400	0517
1633	0517	888	0	F6	8000	8000
1634	0510	888	0	G2	0500	0527
1635	0527	888	0	C7	0510	0530
1636	0530	888	0	F6	7800	7801
1637	0877	888	0	00	0000	7905
1638	83AH	888	0	30	0670	0402
1639	0670	888	0	06	3073	3073
1640	3073	888	0	63	3073	0476
1641	0476	888	0	60	0200	3002
1642	3002	888	0	65	0223	0825
1643	0825	888	0	60	0262	0664
1644	0664	888	0	65	0267	0869
1645	0869	888	0	60	0294	0496
1646	0496	888	0	65	0299	0701
1647	0701	888	0	60	0303	0505
1648	0505	888	0	65	0308	0910
1649	0910	888	0	60	0325	0727
1650	0727	888	0	65	0330	0732
1651	0732	888	0	60	0334	0736
1652	0736	888	0	65	0339	0741
1653	0741	888	0	60	0365	3367
1654	3367	888	0	65	0370	0772
1655	0772	888	0	60	0378	3380
1656	3380	888	0	65	0383	0785

END

2

1  
3

1

2  
PAT

LIR3	0002
LDX	2F
LDL	
HLT	RA
BUF	1F
LDX	2F
LDL	
LDA	ACCUM
STA	ERROR
LDA	3F
STA	START
LDA	PSUDX
HLT	HMH
LDL	
LDL	
LDX	04000
LDL	
HLT	BOP1
TRW	OTAP1
CLL	
LDA	FTAG
TEQ	1F
TRW	OTAP2
TRW	OTAP3
TRD	0400
TBU	8000
TRD	OTAP1
TBT	18
TBU	Y0000
JMP	0000
LDL	
CLX	
ZAP	
STA	0200
STX	0223
STA	0262
STX	0267
STA	0294
STX	0299
STA	0303
STX	0308
STA	0325
STX	0330
STA	0334
STX	0339
STA	0365
STX	0370
STA	0378
STX	0383

FIND\*  
2F

OTPT\*

WRITE  
0000  
PAGE\*  
PAGE\*  
00000  
TERM\*

8000

Y0001  
Y0105  
PAGE\*

2. ENDING OF ASSEMBLY.  
21. FIND\* M.

22. ASSEMBLE TRANSFER

23. CLEAN OUTPUT BUFFER.

24. EJECT PAPER

25. FINISH FLO

26. HALT

27. FLOWCHARTING

1

SRCH\*  
PSIGN

**SPECIAL SECRET OF NEW  
FIND A. IF UNDEFINED PUT IT AS OP IN  
SYMBOL TABLE WITH EQUIVALENT IN M AND C.  
IF DEFINED PUT CONTENTS OF M AND C INTO  
THE QADAAD PROGRAM IN THIS LOCATION.**

1707	3027	888	0	54	2000	83AG
1708	8736	888	0	60	83FB	0740
1709	0740	888	0	65	84FB	0544
1710	0544	888	1	06	0001	0748
1711	0748	888	0	06	0751	0751
1712	0751	888	0	32	0400	0758
1713	0758	888	0	05	0760	8760
1714	8760	888	0	20	86FB	0766
1715	0766	888	0	37	0100	3170
1716	3170	888	0	60	86FB	0974
1717	0974	888	0	60	85AC	000C
1718	0760	888	1	06	9999	0764
1719	0764	888	0	25	83FB	0968
1720	0968	888	0	05	84FB	0008

ERR1*	STL1	ETAB	PSUDX
	STA	TEMP	
	STX	TEMP1	
	IIR3	0001	
	CLX		
	SHR	0400	
ERR2*	LDX	1F	ERR2*
	BUF	ERROR	
	SHL	0100	
	STA	ERROR	
	STA	ACCUM	RX
1	IIR3	9999	
	LOA	TEMP	
	LDX	TEMP1	RL

ERROR SUBROUTINE  
ACCUMULATES IN ERROR THE ERROR CODES  
FOR A LINE.  
ERR1\* CODE IS RB3+1, INDICATING THE FIELD  
EXIT IS IN RL.  
ERR2\* CODE IS IN RA, EXIT IS IN RX.

[illegible]

0000000000  
0000010000  
0000020000  
0000030000  
0000040000  
0000050000  
0000060000  
0000070000  
0000080000  
0000090000  
0000100000  
0000110000  
0000120000  
0000130000  
0000140000  
0000150000  
0000160000  
0000170000  
0000180000  
0000190000  
0000200000  
0000210000  
0000220000  
0000230000  
0000240000  
0000250000  
0000260000  
0000270000  
0000280000  
0000290000  
0000300000  
0000310000  
0000320000  
0000330000  
0000340000  
0000350000  
0000360000  
0000370000  
0000380000  
0000390000  
0000400000  
0000410000  
0000420000  
0000430000  
0000440000  
0000450000  
0000460000  
0000470000  
0000480000  
0000490000

0000544044  
0000544044  
0005544044  
0000044044  
0055544044  
0005544044  
0055544044  
0005544044  
0005544044  
0055544044  
0000044044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0005544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0055544044  
0000544044  
0055544044  
0055544044  
0005544044  
0055544044  
0055544044  
0055544044  
0000544044  
0055544044  
0055544044  
0055544044  
0000544044  
0000544044  
0055544044  
0005544044  
0005544044  
0000544044  
0055544044  
0000544044  
0000544044  
0055544044

0027544044  
0000544044  
0055544044  
0000044044  
0005544044  
0000544044  
0005544044  
0055544044  
0000544044  
0005544044  
0000544044  
0005544044  
0000544044  
0005544044  
0000544044  
0000000044  
0000044044  
0055544044  
0000004044  
0000544044  
0000544044  
0005544044  
0000044044  
0000544044  
0000044044  
0000044044  
0000044044  
0005544044  
0000044044  
0000044044  
0005544044  
0000044044  
0000544044  
0000044044  
0005044044  
0000004044  
0000044044  
0005044044  
0002044044  
0000044044  
0000044044  
0077044044  
0007044044  
222000004

1722					
1723					
1724					
1725	0000	888	0 67	0000	0000
1726	7801	888	0 25	7803	7805
1727	7805	888	0 60	7902	7907
1728	7907	888	0 62	0500	7925
1729	7925	888	0 C7	7931	7925
1730	7931	888	0 87	7935	7937
1731	7935	888	0 67	7935	7907
1732	7937	888	0 F6	8600	7901
1733	7803	888	0 67	7803	7937
1734	7901	888	0 08	0000	7905
1735	7905	888	0 34	8601	7807
1736	7807	888	0 29	8603	7809
1737	7809	888	0 37	0400	7817
1738	7817	888	0 90	000A	7821
1739	7821	888	0 35	7823	7825
1740	7825	888	0 20	7827	000A
1741	7827	888	0 50	0000	7811
1742	7811	888	0 0G	0004	7815
1743	7815	888	0 30	7819	7829
1744	7829	888	0 82	7907	7905
- 1745					

0000  
Y0001  
  
2  
  
  
3  
1  
Y0101  
Y0105

SLR	0000	4999
SLA	Y0003	Y0199 002
SLR	Y0101	Y0105 004
HLT		*
LDA	1F	
STA	Y0102	2F
TRD	OTAP1	
TBT		*
TGR		3F
HLT		2B
TBU	8600	Y0101
HLT		3B
LIR1	0000	Y0105
LDL1	8601	
LDA1	8603	
SHL	0400	
SML	RA	
ERS#	00HHH	H0000
BUF		RA
STL	0000	
IIR1	0004	
LDL#	00020	00000
TEQ	2B	Y0105
END	BOP	

SIMPLE OBJECT PROGRAM LOADING ROUTINE  
GOES INTO BAND 7800, THE ODD LOCATIONS.



IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND.

\* 2. QADAAD ASSEMBLER PASS 2.  
\* TABLE OF CONTENTS  
\* A. AJST\* SUBROUTINE.  
\* B. BEGINNING OF ASSEMBLY  
\* C. CONTROL OPS.  
\* D. DEFINE ADDRESS (DEFN\*)  
\* E. EDIT INPUT CARD  
\* F. FIND AND RESERVE BEST LOCATION (FARB\*)  
\* L. PROCESS A ADDRESS.  
\* O. OUTPUT SUBROUTINE.  
\* P. PROCESSING OF INSTRUCTIONS.  
\* Q. MASTER ADDRESS CALCULATOR (FIND\*)  
\* S. SYMBOL TABLE SEARCH (SRCH\*)  
\* X. EXAMINE REMARKS FIELD  
\* Z. ENDING OF ASSEMBLY.  
\* THIS PASS DOES THE ACTUAL ASSEMBLY.  
\* THE SHOW BEGINS AT ROUTINE B.  
\*

```

      (---IN---)
      :
      :
0148  :
-----:
: S1. SCRAMBLE :
-----:
      :
      : 0(.....)0
0154  :
(-----)
: S2. SYMBOL:TABLE ) EQ: ..... DEF
(-----)
      :
      : NEQ:
      :
0156  :
(-----) EQ: .....0
: S3. TABLE:ZERO )
(-----) NEQ:.....0
      :
      : 0(.....)0
0162  :
-----:
: S4. NOT FOUND. : .....UNDEF
-----:

```

```

* S. SYMBOL TABLE SEARCH (SRCH*)
* THIS SUBROUTINE LOOKS UP A 5-CHARACTER
* QUANTITY TO SEE IF IT IS IN THE SYMBOL TABLE.
* OP-CODES, REGIONAL ADDRESSES, PAIR ADDRESSES,
* AS WELL AS SYMBOLIC ADDRESSES ARE KEPT IN THE
* SYMBOL TABLE. THERE ARE TWO EXITS, DEPENDING
* ON WHETHER THE SYMBOL IS OR IS NOT IN THE
* TABLE. ALL REFERENCES TO THE SYMBOL TABLE
* ARE MADE VIA SRCH*.
*
* S1. SCRAMBLE
* THE SYMBOL IS CONVERTED TO A THREE-DIGIT NUM-
* BER TO INDICATE WHERE THE SEARCH WILL START.
* THIS SPEEDS UP THE SEARCH CONSIDERABLY.
*
* S2. SYMBOL:TABLE
* IF THE SYMBOL IS AT THIS PLACE IN THE
* TABLE, GO TO DEF.
*
* S3. TABLE:ZERO
* IF THE TABLE ENTRY IS ZERO, GO TO S4.
* OTHERWISE WE MOVE TO THE NEXT TABLE ENTRY
* AND RETURN TO S2.
*
* S4. NOT FOUND.
* WE HAVE ENCOUNTERED A NEW SYMBOL SINCE THE
* TABLE IS INITIALLY ALL ZEROES.
* STORE THE NEW SYMBOL IN THE TABLE HERE
* AND GO TO UNDEF.
*
* CODING DETAILS:
* ON INPUT, RL IS THE SYMBOL, RA IS UNDEF,
* AND RX IS DEF. OUTPUT IN RB1 IS THE LOCATION
* IN THE TABLE, AND IF DEFINED THE EQUIVALENT
* OF THE SYMBOL APPEARS IN RA. THERE IS ROOM
* FOR 1000 SYMBOLS. IF THE 1001ST SYMBOL
* COMES ALONG, THE MACHINE LOOPS INDEFINITELY.
*

```

```

* F. FIND AND RESERVE BEST LOCATION (FARB*)
* THIS SUBROUTINE IS USED TO CHOOSE LOCATIONS
* FOR A M OR C ADDRESSES OF INSTRUCTIONS.
* THE CORRESPONDING H-FIELD IS INTERPRETED AND
* THE CHOICE IS MADE ON THIS BASIS.
* F1. EXAMINE H-FIELD
* IF IT SPECIFIES C(CORE) GO TO F4.
* IF IT SPECIFIES D(DRUM) OR IS BLANK,
* GO TO F3 WITH RB6 SET TO 0.
* IF IT SPECIFIES H(HIGH SPEED BANDS),
* GO TO F3 WITH RB6 EQUAL TO 2.
* THREE NUMERICS OR +NN MEANS A HAND-PICKED
* LEVEL OR A CHANGE IN LEVEL ON THE DRUM, TO F2.
* TWO NUMERICS MEANS A HANDPICKED HIGH SPEED
* LEVEL, GO TO F2.
* ANY OTHER MEANS THE H-FIELD IS IN ERROR.
* GO TO F3 AND TREAT AS BLANK.
* F2. USE HAND LEVEL
* THE H-FIELD SPECIFIES A HAND PICKED LEVEL.
* THIS SUPERCEDES THE LEVEL CALCULATED
* BY QADAAD, ALTHOUGH IT WILL BE CHECKED
* LATER BY THE AJST* ROUTINE.
* F3. ADJUST FOR PAIRS
* IF RB2 CONTAINS 5 AT THIS POINT WE HAVE
* A PAIR ADDRESS, AND RB6 IS INCREASED BY 1.
* THE CALCULATED LEVEL IS ADJUSTED 1 IF IT IS
* A MINUS-PAIR ADDRESS. RB6 IS NOW EQUAL TO:
* 0: LOOK ON DRUM
* 1: LOOK FOR PAIR ON DRUM
* 2: LOOK FOR HIGH SPEED
* 3: LOOK FOR PAIR ADDRESS IN HIGH SPEED AREA
* THE SETTING OF RB6 IS USED TO CONTROL THE
* APPROPRIATE OPERATIONS BELOW. GO TO F6.
* F4. ROOM IN CORE
* IF RB2 CONTAINS 5 WE HAVE A PAIR ADDRESS AND
* MUST RESERVE 2 LOCATIONS, OTHERWISE 1 LOC-
* ATION IN CORE. IF THERE IS NO ROOM LEFT IN
* THE B000-B999 AREA, A SEMICOLON ERROR
* INDICATION IS GIVEN AND WE TRY HIGH SPEED
* ACCESS BY GOING TO F3.
* F5. ASSIGN CORE ADDR.
* CALCULATE THE EQUIVALENT OF THIS ADDRESS
* AND THE ADDRESS ONE LESS IN CASE OF A PAIR
* ADDRESS. EXIT.
* F6. INITIALIZE
* CALCULATE THE STARTING DRUM LEVEL, AND ALSO
* MAKE AN EXTRA COPY OF LEVEL 199 AS LEVEL -1
* IN CASE OF PAIR ADDRESS PROCESSING.
* F7. TRY LEVEL
* IF A DRUM ADDRESS SATISFYING ALL THE
* REQUIREMENTS INDICATED BY RB6 EXISTS ON THIS
* LEVEL, GO TO F9.
* F8. DRUM EXHAUSTED
* IF THE LEVEL WAS HAND CALCULATED, A SEMICOLON
* ERROR IS INDICATED THE FIRST TIME STEP F8
* IS EXECUTED.
* IF WE HAVE GONE ALL THE WAY AROUND THE DRUM,
* A SEMICOLON ERROR IS GIVEN AND THE ADDRESS
* 0000 IS ASSIGNED. TO F11.

```

0347

F10.RESERVE ADDRESS.

0360

F11.FINISH UP

EXIT

IF WE HAVE EXHAUSTED THE HIGH SPEED BANDS,  
A SEMICOLON ERROR IS GIVEN AND WE TRY THE  
WHOLE DRUM, GOING TO F6.  
OTHERWISE WE STEP TO THE NEXT DRUM LEVEL  
AND RETURN TO F7.

F9. CALCULATE ADDRESS  
WE TRY TO FIGURE OUT WHAT DRUM ADDRESS WE  
HAVE FOUND, PICKING THE SMALLEST ACCEPTABLE  
ADDRESS ON THIS LEVEL. A SINGLE WORD OF  
40 BITS IS KEPT FOR EACH DRUM LEVEL,  
CORRESPONDING TO BANDS 00 THRU 78, THE 5-BITS  
COVER BANDS 00 THRU 18, 4-BITS 20 THRU 38,  
AND SO ON.

F10.RESERVE ADDRESS.  
FOR A PAIR ADDRESS THE ADDRESS IN THIS BAND  
ON TWO ADJACENT LEVELS IS RESERVED.  
OTHERWISE A SINGLE ADDRESS IS RESERVED, BY  
TURNING ITS BIT OFF IN THE TABLE. AFTER THE  
OPERATION, LEVELS -1 AND 199 ARE COMBINED  
AS LEVEL 199.

F11.FINISH UP  
CALCULATE THE ADDRESS ADJACENT TO THE ONE  
FOUND IN CASE OF A POSSIBLE MINUS-PAIR  
ADDRESS, AND EXIT.

CODING DETAILS:  
INDEX REGISTERS 1 2 AND 3 ARE NOT CHANGED BY  
FARB\*. ON INPUT THE H FIELD IS SPECIFIED  
BY RB3, THE CALCULATED BEST DRUM LEVEL IS IN  
RA, AND THE EXIT IS IN RL. THE OUTPUT  
LOCATION FOUND IS IN RA AND AN ADJACENT  
LOCATION IS STORED IN A SPECIAL TABLE.

```

(---[N---)
      0377
(-----)
Q1. WHAT KIND
(-----)
      BLK:.....)0
      *! .....)0
      REG:.....)0
      ABS:.....)0
      NF: .....)0
      NB: .....)0
      NI: .....)0
      +-: .....)0
      NX: .....)0
      SYM:.....V
      0(.....(0
      0419
(-----)
Q2. BLANKIZERO
(-----)
      EQL:.....UNDEF
      NEQ:.....DEF
      0(.....(0
      0423
(-----)
Q3. 'A' LOCATION
(-----)
      0(.....(0
      0428
(-----)
Q4. CHANGE TO R0000.
(-----)
      0(.....(0
      0434
(-----)
Q5. PROCESS ABS ADDR.
(-----)
      BAD:.....V
      OK: .....DEF
      0(.....(0
      0442
(-----)
Q6. ERROR
(-----)
      0(.....(0
      0452
(-----)
Q7. I(N):ZERO
(-----)
      EQ: .....UNDEF
      NEQ:.....DEF
      0(.....(0
      0456
(-----)
Q8. J(N):ZERO
(-----)
      EQ: .....)0
      NEQ:.....DEF

```

```

* Q. MASTER ADDRESS CALCULATOR (FIND*)
* THIS SUBROUTINE IS GIVEN THE CONTENTS OF
* THE SYMBOLIC A,M, OR C FIELD OF THE CARD AND
* ANALYZES IT. THERE ARE TWO EXITS, ACCORDING
* TO WHETHER THE ADDRESS IS DEFINED OR NOT.
* Q1. WHAT KIND
* IF BLANK GO TO Q2.
* IF SELF, GO TO Q3.
* IF FOUR RIGHTHAND PARTS ARE NUMERIC, TO Q4.
* IF THE LEFTMOST CHARACTER IS BLANK, HOWEVER,
* GO TO Q5.
* IF LOCAL FORWARD ADDRESS, TO Q7.
* IF LOCAL BACKWARD ADDRESS, TO Q8.
* IF LOCAL PLAIN ADDRESS N, TO Q9.
* IF PAIR ADDRESS, SET RB2 TO 5 AND GO TO Q10.
* IF THE SYMBOL FAILS TO PASS THE ABOVE AND
* BEGINS WITH A NUMERIC, GO TO Q6.
* OTHERWISE IT IS SYMBOLIC, WE SET RB2 TO 4
* AND GO TO Q10.
* Q2. BLANKIZERO
* IF 'BLANK' IS ZERO, THE BLANK ADDRESS IS
* UNDEFINED, AND WE GO TO UNDEF,
* ELSE TO DEF.
* Q3. 'A' LOCATION
* THE * IS DEFINED AS THE VALUE OF A LOCATION.
* IF IT APPEARS IN A, OR IN CERTAIN CONTROL OPS
* IT IS THE VALUE OF THE PRECEDING A LOCATION.
* TO DEF.
* Q4. CHANGE TO R0000.
* CHANGE THE REGIONAL ADDRESS TO R0000 AND SET
* RB2 TO ZERO. WE GO THEN TO LOOK THIS UP
* IN THE SYMBOL TABLE, AT STEP Q10.
* Q5. PROCESS ABS ADDR.
* IF ANY PART OF THE ADDRESS IS BLANK OR
* HAS ZONES OF 2 OR 3, GO TO Q6. OTHERWISE
* USE THE ZONES TO PRODUCE UNDIGITS FOR ABCFGH,
* AND SEND THE RESULTING ADDRESS TO DEF.
* Q6. ERROR
* SET UP ERROR FLAG FOR CURRENT FIELD
* AND SET THE ADDRESS TO ZERO. TO DEF.
* Q7. I(N):ZERO
* IF THE FORWARD LOCAL TABLE ENTRY FOR N IS
* ZERO IT IS UNDEFINED, WE GO TO UNDEF, ELSE IT
* IS DEFINED AND DEF.
* Q8. J(N):ZERO
* IF THE BACKWARD LOCAL TABLE ENTRY FOR N IS
* ZERO IT IS UNDEFINED AND WE GO TO Q6 SINCE
* THIS SHOULDN'T HAPPEN. ELSE IT IS A
* DEFINED ADDRESS WHICH IS SENT TO DEF.
* Q9. I(N):ZERO
* IF THE FORWARD LOCAL TABLE ENTRY FOR N IS
* ZERO THIS ADDRESS IS UNDEFINED, GO TO UNDEF.
* ELSE IT IS DEFINED AND WE TRANSFER IT TO THE
* BACKWARD LOCAL TABLE AND EXIT TO DEF.
* IN EITHER CASE RESET FORWARD LOCAL ENTRY 0.
* Q10. SRCH*
* SEARCH FOR THE ITEM IN THE SYMBOL TABLE.

```

IF FOUND,GO TO DEF,ADJUSTING FOR REGIONAL ADDRESS IF NECESSARY. IF NOT FOUND, WE GO TO UNDEF.

CODING DETAILS:

INPUT TO FIND\* IS DEF IN RX AND UNDEF IN RL. RB3 CONTAINS THE FIELD TO BE EXAMINED. AT EXIT DEF, RA CONTAINS THE DEFINED EQUIVALENT IN ITS C ADDRESS POSITION. AT EXIT UNDEF, RB2 CONTAINS INFORMATION ABOUT THE TYPE OF ADDRESS AS FOLLOWS:

- 0: REGIONAL
- 1: LOCAL FORWARD N IS IN RB5
- 2: BLANK
- 3: LOCAL PLAIN N IS IN RB5
- J: SYMBOLIC SPOT IN SYMBOL TABLE IS RB1
- K: PAIR ADDRESS RB5 IS 0 FOR &, 1 FOR -.



```

* 0. DEFINE ADDRESS (DEFN*)
* THIS SUBROUTINE IS USED AFTER FIND* HAS
* DETERMINED AN ADDRESS IS UNDEFINED. IF THIS
* IS NOT AN ERROR CONDITION, SOME WAY OF
* CALCULATING AN ADDRESS, USUALLY FARB*, IS
* USED AND THEN THIS ROUTINE DEFN* TAKES OVER.
*
* D1. WHAT TYPE
* IF THE ADDRESS TO BE DEFINED IS REGIONAL,
* GO TO D2.
* IF LOCAL FORWARD, ENTER IN I TABLE AND EXIT.
* IF BLANK, ENTER IN 'BLANK' AND EXIT.
* IF LOCAL PLAIN, ENTER IN J TABLE AND EXIT.
* IF SYMBOLIC, ENTER IN EQUIVALENTS TABLE, EXIT
* IF PAIR ADDRESS, GO TO D3.
*
* D2. CALCULATE BASE
* REGIONAL ADDRESSES ARE DEFINED ONLY BY
* CONTROL OPS LIKE BLR. THE DEFINING ADDRESS
* MINUS THE INCREMENT, THE ADDRESS CORRESPON-
* DING TO R0000, IS STORED IN THE
* EQUIVALENTS TABLE. EXIT.
*
* D3. STORE TWO.
* THE DEFINED ADDRESS IS STORED IN THE SYMBOL
* TABLE. THEN A IS CHANGED TO - OR VICE VERSA
* AND THAT SYMBOL PLUS ITS EQUIVALENT ARE ALSO
* STORED AWAY. THE ASSUMPTION IS MADE THAT
* FARB* WAS USED TO CALCULATE THE ADDRESSES.
* EXIT.
*
* CODING DETAIL:
* THE EXIT IS INPUT IN RL AND THE CALCULATED
* ADDRESS IN RA. OTHER INPUTS ACTUALLY USED
* ARE RB2 TO TELL THE TYPE, AND RB1 AND RB3 TO
* GIVE EXTRA INFORMATION AS SUPPLIED BY THE
* FIND* SUBROUTINE. AT EXIT, RA CONTAINS THE
* DEFINED EQUIVALENT.

```

```

      (---IN---)
      :
      :
0536  :
      :-----) 000A..... EXIT
      : A1. WHAT TYPE ADDRESS ) 4000.....)0
      :-----) 0000.....)0
      :
      :
      : 0(.....)0
0544  :
      :-----)
      : A2. FIGURE DRUM ROLL :
      :-----)
      :
      :
      : 0(.....)0
0552  :
      :-----)
      : A3. CHECK BAD TIMING. :..... EXIT
      :-----)

```

```

* A. AJST* SUBROUTINE.
* THIS SUBROUTINE IS PART OF THE WAY QADAAD
* FINDS LATENCY. AJST* IS USED ON M AND C
* ADDRESSES. FIRST AN OPTIMUM LEVEL
* 'OPTIM' IS CALCULATED BY QADAAD. AJST* USES
* THIS TO FIND THE CURRENT LEVEL, GIVEN THE
* ACTUAL M OR C ADDRESS.
* A1. WHAT TYPE ADDRESS
* IF THE ASSIGNED ADDRESS D HAS ANY UNDIGITS
* IT IS ASSUMED TO BE IMMEDIATE ACCESS AND
* 'OPTIM' IS THE ANSWER. EXIT.
* IF THE ASSIGNED ADDRESS D IS ON THE HIGH-
* SPEED BANDS, GO TO A2.
* IF THE ASSIGNED ADDRESS D IS ON THE STANDARD
* PART OF THE DRUM, D IS THE ANSWER. GO TO A3.
* A2. FIGURE DRUM ROLL
* THE ANSWER IS D-OPTIM MODULO 50,
* ADDED TO OPTIM.
* A3. CHECK BAD TIMING.
* IF D COMPARED TO OPTIM INDICATES A WAIT OF
* 48 OR 49 ON HSB OR OF 198 OR 199 ON REST OF
* DRUM, THE ERROR FLAG - IS PUT ON THE LISTING.
* CODING DETAILS:
* INPUT IS THE ASSIGNED ADDRESS IN RA AND THE
* EXIT IN RL. OUTPUT IN RA IS SOME LOCATION
* ON THE APPROPRIATE DRUM LEVEL.
* EXIT.
*

```

```
(---IN---)
:
:
0571 :
-----
: 01. TRANSFER :
-----
:
:
0578 :
(-----)
( 02. BUFFER FULL ) NO: ..... EXIT
(-----)
      YES: :
:
0582 :
-----
: 03. WRITE TAPE : ..... EXIT
-----
```

```
* 0. OUTPUT SUBROUTINE.
* THIS ROUTINE IS USED TO TRANSMIT AN ASSEMBLED
* INSTRUCTION TO THE OUTPUT TAPE.
* 01. TRANSFER
* THE LOCATION IS IN THE FORM RRROS0AAAA WHERE
* RRR ARE RELOCATION DIGITS COPIED FROM THE
* CARD, S IS THE ASSEMBLED SIGN, AND AAAA IS
* THE ASSEMBLED LOCATION. MOVE THE LOCATION
* AND THE ASSEMBLED INSTRUCTION INTO THE
* OUTPUT BUFFER.
* 02. BUFFER FULL
* IF THE BUFFER DOES NOT HAVE 50 INSTRUCTIONS,
* EXIT.
* 03. WRITE TAPE
* WRITE THE BUFFER OUT ON THE OUTPUT TAPE AND
* CLEAR THE BUFFER AGAIN. EXIT.
*
*
*
```

```

      (---IN---)
      :
      : 0(.....)(0
0618 :
      :
      : (-----)
      : ( E1. CHECK LINE NO. ) BAD:.....)0
      : (-----)
      :
      : OK:
      :
      : 0623
      :
      : -----
      : E2. TRANSFER
      : -----
      :
      :
      : 0642
      :
      : -----
      : E3. SEPARATE OFF R, H.
      : -----
      :
      :
      : 0668
      :
      : -----
      : E4. MOVE COMMENTS
      : -----
      :
      :
      : 0690
      :
      : -----
      : E5. CONSTRUCT CONSTANTS
      : -----
      :
      :
      : 0704
      :
      : -----
      : E6. EDIT OP CODE.
      : -----
      :
      :
      : 0715
      :
      : (-----)
      : ( E7. INPUT BUFFER EMPTY ) NO: ..... )0
      : (-----)
      :
      : YES:
      :
      :
      : 0720
      :
      : -----
      : E8. SWAP BUFFERS
      : -----
      :
      :
      :
      : 0753
      :
      : (-----)
      : ( E9. OP SRCH*. )
      : (-----)
      :
      : ON: .....
      : OFF: .....
      : CONT: .....
      : SYM: .....
      : BAD: .....

```

- \* E. EDIT INPUT CARD.
- \* THIS IS WHERE THE PROCESSING OF EACH CARD
- \* STARTS. THE PURPOSE IS TO TAKE THE INFOR-
- \* MATION FROM THE INPUT TAPE AND TRANSFER IT
- \* TO THE PRINTER AREA READY TO BE PRINTED AND
- \* ALSO EDIT IT INTO A FORM MORE DIGESTIBLE FOR
- \* ASSEMBLY PROCESSING.
- \* THE CARDS ARE REPRESENTED AS 20 WORDS ON
- \* TAPE, A ZONE WORD IMMEDIATELY PRECEDING ITS
- \* CORRESPONDING NUMERIC.
- \* 0.1 LINE NUMBER
- \* 2.3 A AR AH AS 1111123330
- \* 4.5 M MR MH AS 1111123330
- \* 6.7 C CR CH AS 1111123330
- \* 8.9 OP IR AS 1112000000
- \* 10-19 REMARKS AS 0111111...
- \* E1. CHECK LINE NO.
- \* IF THE LINE NUMBER IS NOT EXACTLY 1 HIGHER
- \* THAN THE PRECEDING, STOP THE MACHINE AND
- \* THEN RETURN TO E1.
- \* E2. TRANSFER
- \* MOVE THE LEFT HALF OF THE CARD TO THE PRINTER
- \* AREA EDITING IT SLIGHTLY FOR READABILITY.
- \* E3. SEPARATE OFF R, H.
- \* EDIT THE A-AR-AH,M-MR-MH,C-CR-CH, CHANGING
- \* THE SYMBOLIC PORTION TO A SINGLE WORD WITH
- \* THE ZONES AT THE LEFT: ZZZZZNNNNN;
- \* ACCUMULATE THE R DIGITS, AND PUT THE
- \* H-FIELD INTO THE FORM 00ZZZ00NNN.
- \* E4. MOVE COMMENTS
- \* MOVE THE REMARKS FIELD INTO REGION R.
- \* E5. CONSTRUCT CONSTANTS
- \* PUT TOGETHER THE M AND C FIELDS INTO
- \* POSITIVE CONSTANTS MC,MCZ,AND MCN AS THE
- \* CON NUM ZON CONTROL OPS ARE SUPPOSED TO DO.
- \* E6. EDIT OP CODE.
- \* PUT THE OPERATION CODE FIELD INTO THE FORM
- \* 88ZZZ88NNN. THIS FORM IS USED BECAUSE IT
- \* CANNOT CONFLICT WITH ANY SYMBOL IN THE
- \* SYMBOL TABLE.
- \* PUT THE IR FIELD INTO THE FORM Z000000N00.
- \* E7. INPUT BUFFER EMPTY
- \* IF THE CURRENT INPUT BUFFER IS NOT YET
- \* EMPTY, GO TO E9.
- \* E8. SWAP BUFFERS
- \* AN INPUT BUFFER HAS ALREADY BEEN LOADED
- \* WE SWAP INPUT BUFFERS AND INITIATE READING IN
- \* TO THE EMPTY BUFFER.
- \* E9. OP SRCH\*.
- \* IF OP IS \*ON\* GO TO C6.
- \* IF MASTER SWITCH IS OFF GO TO C7.
- \* ELSE SEARCH FOR OP-CODE IN THE SYMBOL TABLE.
- \* IF IT IS A CONTROL OP, GO TO C1.
- \* IF IT IS A MACHINE SYMBOLIC OP, GO TO THE
- \* MAIN PROCESSING ROUTINE P1.
- \* IF IT IS NOT IN THE TABLE, GIVE AN ERROR
- \* INDICATION AND CHANGE OP TO 57. GO TO P1.
- \* C6
- \* C7
- \* C1
- \* P1
- \* P1

IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THEREIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF SPERRY RAND CORPORATION, AND FURTHER AGREES TO SURRENDER SAME TO SPERRY RAND CORPORATION, UPON DEMAND

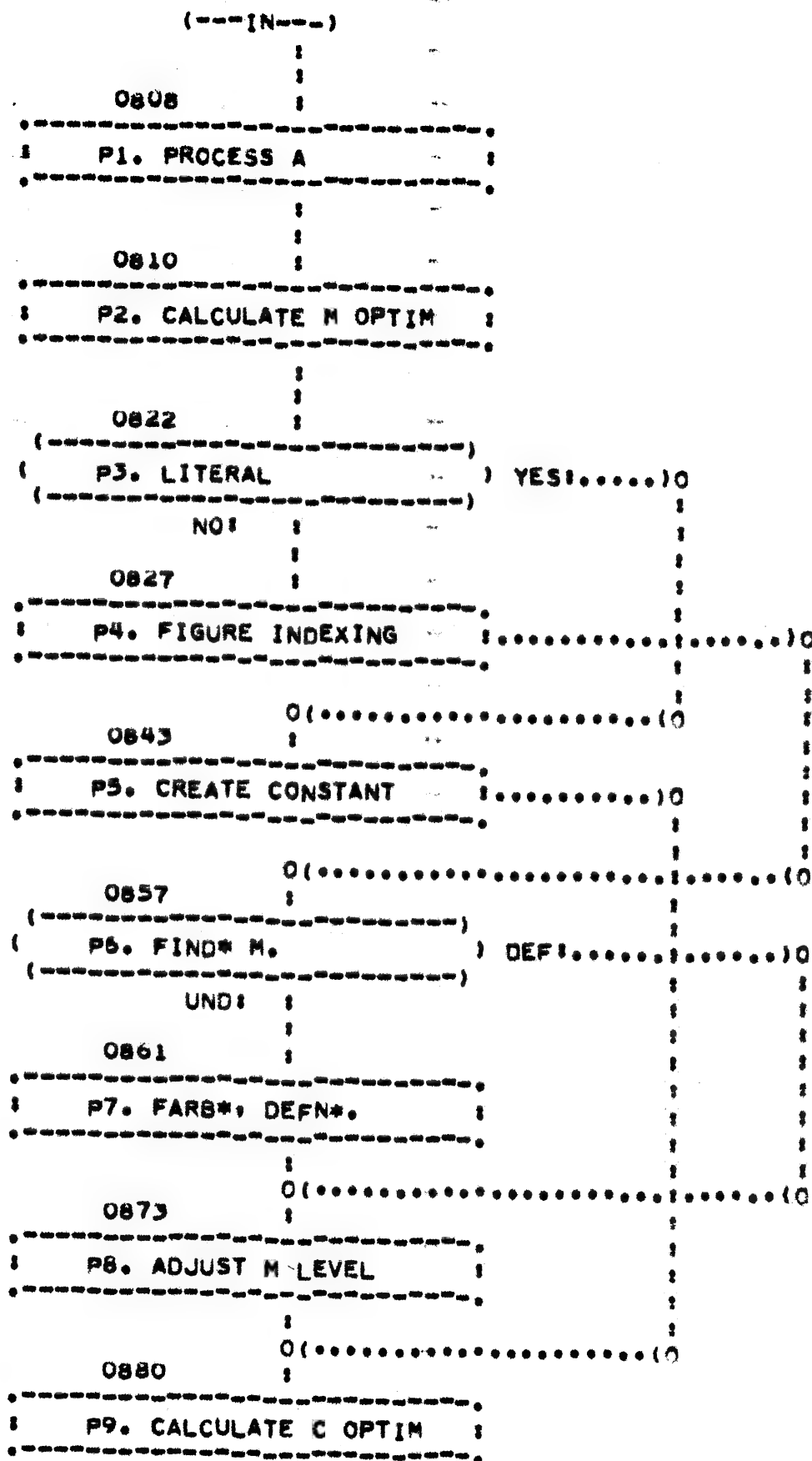
**Remington Rand Univac**  
DIVISION OF SPERRY RAND CORPORATION  
PHILADELPHIA, PA.

\* \* \* \* \*

```

* L. PROCESS A ADDRESS.
* THIS ROUTINE IS USED FOR INSTRUCTIONS AND
* ALSO FOR CONTROL OPS CON+NUM, AND ZON.
*
* L1. CHECK BLANK A
* IF A IS NOT BLANK BUT THE PRECEDING INSTRU-
* CTION HAD A BLANK ADDRESS, GIVE AN ERROR
* INDICATION.
*
* L2. FIND* A.
* FIND A (ROUTINE G). IF IT IS ALREADY DEFINED,
* GO TO L4.
*
* L3. FARB*.DEFN*.
* A IS AN UNDEFINED ADDRESS. IF IT IS REGIONAL,
* LOCAL FORWARD, OR BLANK THIS IS AN ERROR
* CONDITION AND A NEW LOCATION IS ASSEMBLED.
* OTHERWISE USE THE LINE NUMBER AS RANDOM DRUM
* LEVEL AND GO THRU FARB* (ROUTINE F) AND
* DEFN* (ROUTINE D).
*
* L4. ADJUST A LEVEL.
* IF THE NEW A ADDRESS MATCHES THE LAST M OR C
* ADDRESS, USE THEIR LEVEL, EXCEPT ON M ADDRESS
* MATCH WHERE THE C ADDRESS HAD UNDIGITS. IN
* THE LATTER CASE THE PREVIOUS C LEVEL IS USED.
* OTHERWISE USE THE A ADDRESS AS THE DRUM LEVEL
*
* L5. ZERO TO BLANK.
* THE LOCATION 'BLANK' IS SET TO ZERO SINCE AT
* THIS POINT BLANK ADDRESSES ARE UNDEFINED.
* EXIT.

```



- \* P. PROCESSING OF INSTRUCTIONS
- \* P1. PROCESS A
- \* EXECUTE THE L ROUTINE.
- \* P2. CALCULATE M OPTIM
- \* IF THE IR FIELD IS NON BLANK AND NOT A
- \* LITERAL, ADD 1 TO A LEVEL FOR INDEX REGISTER
- \* MODIFICATION TIME. THEN ADD THE APPROPRIATE
- \* AMOUNT TO GET THE OPTIMUM M ADDRESS LEVEL,
- \* AS DETERMINED BY THE OPERATION CODE.
- \* PUT THIS IN 'OPTIM'.
- \* P3. LITERAL
- \* IF THE IR FIELD CONTAINS A NUMBER SIGN GO TO
- \* P5.
- \* P4. FIGURE INDEXING
- \* ADJUST BIT 4 OF THE OPERATION CODE AND
- \* THE SIGN OF THE RESULT TO GIVE THE INDEX
- \* REGISTER MODIFICATION DESIRED. GO TO P6.
- \* P5. CREATE CONSTANT
- \* GO THRU FARB\* AND AJST\* (ROUTINES F AND A)
- \* TO DETERMINE AN ADDRESS AND DRUM LEVEL FOR
- \* THE LITERAL CONSTANT. ASSEMBLE THE POSITIVE
- \* CONSTANT INTO THIS LOCATION, (ROUTINE O)
- \* TRANSFERRING THE MR DIGIT INTO AN AR DIGIT
- \* FOR THE CONSTANT.
- \* MARK THE C FIELD BLANK AND GO TO P9.
- \* P6. FIND\* M.
- \* FIND M(ROUTINE Q). IF IT IS ALREADY DEFINED,
- \* GO TO P8.
- \* P7. FARB\*, DEFN\*.
- \* M IS AN UNDEFINED ADDRESS. IF IT IS
- \* REGIONAL OR LOCAL PLAIN THIS IS AN ERROR
- \* CONDITION AND ZERO IS ASSEMBLED. IF IT IS
- \* BLANK AND IF THE OP-CODE IS ONE THAT IGNORES
- \* M, \* IS ASSEMBLED.
- \* OTHERWISE FARB\* AND DEFN\* (ROUTINES F,D) ARE
- \* USED TO DEFINE M ON THE BASIS OF OPTIM AND
- \* THE MH-FIELD.
- \* P8. ADJUST M LEVEL
- \* THE DRUM LEVEL AT THIS POINT IS NOW
- \* DETERMINED BY SUBROUTINE A.
- \* P9. CALCULATE C OPTIM
- \* WE BEGIN TO WORK ON THE C ADDRESS NOW.
- \* THE OP CODE FOUND IN THE SYMBOL TABLE IS IN A
- \* SPECIAL FORMAT OPTSOOMMCC.
- \* HERE OP IS THE TWO DIGIT OPERATION CODE.
- \* S IS 1 FOR IGNORE C, 2 FOR IGNORE M.
- \* MM AND CC ARE INCREMENTS FOR DETERMINING
- \* LATENCY. T IS THE TYPE OF LATENCY RULE
- \* REQUIRED, AS FOLLOWS:
- \* 0: C IS MMCC FIXED LEVEL.
- \* 1: C IS MMCC FIXED LEVEL.
- \* 2: C IS A+CC
- \* 3: SHIFT COMMANDS C IS A+N+CC.
- \* WE NOW CALCULATE OPTIM FOR C, ACCORDING TO
- \* THE RULE GIVEN BY T.
- \* P10. FIND\* C.



XI  
E1

FIND C (ROUTINE Q). IF IT IS ALREADY DEFINED,  
GO TO P12.  
P11.FARB\*,DEFN\*.  
C IS AN UNDEFINED ADDRESS. IF IT IS  
REGIONAL OR LOCAL PLAIN: THIS IS AN ERROR  
CONDITION AND ZERO IS ASSEMBLED.  
IF IT IS BLANK AND THE OP-CODE IGNORES C,  
IT IS MADE EQUAL TO M. OTHERWISE FARB\* AND  
DEFN\* (ROUTINES F,D) ARE ACTIVATED TO DEFINE  
C ON THE BASIS OF OPTIM.  
BLANK ADDRESS HERE MAY BE PUT IN BOOA  
OR BOOF REGION OF CORE.  
P12.ADJUST C LEVEL  
THE DRUM LEVEL AT THIS POINT IS NOW  
DETERMINED BY SUBROUTINE A.  
P13. SYNTHESIZE  
THE OP, M AND C ARE NOW PUT TOGETHER  
INTO A TEN-DIGIT INSTRUCTION.  
P14.ASSEMBLE  
USE ROUTINE Q TO OUTPUT THE ASSEMBLED  
LINE OF CODE.  
P15.EDIT  
THE ASSEMBLED INSTRUCTION IS EDITED AND  
SENT TO THE PRINTER AREA.  
FOR CONTROL OPERATIONS, HOWEVER, THIS PART  
IS SET TO BLANKS.  
P16.FLOW CHART  
IF THE CONTROL OPERATION FLO  
HAS APPEARED EARLIER, GO TO THE FLOW-  
CHARTING ROUTINE X1.  
P17. PRINT  
MOVE THE REMARKS TO THE PRINTER AREA FROM  
REGION R. TAKE ALL ERROR CONDITIONS THAT  
HAVE BEEN DETECTED AND PUT THEM ON THE LIST-  
ING. THERE IS ROOM FOR AT MOST 5 ERRORS.  
INTERROGATE THE PAGE-LINE COUNTER TO SEE IF  
A SKIP TO NEXT PAGE IS NECESSARY.  
FINALLY PRINT THE LINE, AND GET READY FOR  
THE NEXT LINE: GOING TO E1.

```

(---IN---)
1046
(-----)
C1. BRANCH TO OP ) CON:.....)0
(-----)          BLR:.....)0
                   COR:.....)0
                   EQU:.....)0
                   HHH:.....)0
                   OFF:.....)0
                   FLO:.....)0
                   PAT:.....)0
                   TYP:.....)0
                   ERR:.....)0
                   END:.....)0
1071
(-----)
C2. PROCESS A )
(-----)
1085
(-----)
C3. UPDATE AVAIL TABLE )
(-----)
1177
(-----)
C4. RESERVE CORE )
(-----)
1192
(-----)
C5. DEFINE ADDRESS )
(-----)
1206
(-----)
C6. ON OFF )
(-----)
1217
(-----)
C7. ASSEMBLER OFF )
(-----)

```

```

* C. CONTROL OPS.
* C1. BRANCH TO OP
* IF OP IS BLANK, GO TO P15.
* FOR CON,NUM,ZON,ALF, GO TO C2.
* FOR BLA,BLR GO TO C3.
* FOR COR GO TO C4.
* FOR EQU GO TO C5.
* FOR HHH, SET MH INTO HTAG AND GO TO P15.
* FOR OFF GO TO C6
* FOR FLO, SET FLOWCHARTING TAG ON AND GO TO
* P15 ALSO.
* FOR PAT,PRINT THE AVAILABILITY TABLE AND
* GO TO E1.
* FOR TYP, HALT AND INSERT RA IN TYPE OF PROG.
* GO TO P15.
* IF AN ERROR OCCURS WHILE PROCESSING ONE OF
* THE ABOVE, NO ADDITIONAL ACTION TAKES PLACE
* AND WE GO TO P15.
* FOR END, GO TO THE ENDING ROUTINE Z1.
* C2. PROCESS A
* USE ROUTINE L TO GET THE A ADDRESS,
* THEN USE THE IR FIELD TO INDICATE THE
* SIGN AND GO TO P14 TO ASSEMBLE THE INSTRU-
* TION.
* C3. UPDATE AVAIL TABLE
* CHECK CH-FIELD FOR INCREMENT. IF BLANK,
* USE 1; ELSE USE CH MOD 100. FIND* M.
* IF UNDEFINED, ERROR. IF C IS BLANK, SET
* C EQUAL TO M, ELSE FIND* C. IF UNDEFINED,
* ERROR. FIND THE STARTING PLACE IN THE
* AVAILABILITY TABLE, AND KEEP RESERVING OR
* UNRESERVING ONE LOCATION AT A TIME
* UNTIL DONE. GO TO C5.
* C4. RESERVE CORE
* IF M IS UNDEFINED, OR THERE ISNT ENOUGH ROOM
* IN CORE THIS IS AN ERROR. OTHERWISE RESERVE
* THE SPACE IN CORE, AND GO TO C5.
* C5. DEFINE ADDRESS
* FIND A (ROUTINE Q). IF DEFINED, OR IF A
* PAIR ADDRESS, THE A FIELD IS IN ERROR, ELSE
* IF NONBLANK DEFINE IT (ROUTINE Q).
* GO TO P15.
* C6. ON OFF
* IF M ADDRESS MATCHES THE TYPE OF PROGRAM, THE
* MASTER SWITCH IS TURNED ON OR OFF, GO TO P15.
* C7. ASSEMBLER OFF
* IF FLOWCHARTING, GO TO E1.
* OTHERWISE PRINT THE WORD OFF ON THE LISTING,
* RETURNING TO P17.

```

(---IN---)

```

1262
(-----)
X1. WHAT OK FIELD ) G ..... P17
(-----) CODI.....)0
TABI.....)V
K. ....)0
KN. ....)0
OTHR.....)0
O(.....)0
1309
X2. SCAN FOR #
O(.....)0
1418
X3. TRANSFER REMARKS ..... P17
O(.....)0
1447
X4. COMPILE O1 OP ..... P17
O(.....)0
1464
X5. COMPILE CONDITION .....)0
O(.....)0
1486
X6. FINISH PREV SECTION
1492
X7. INITIALIZE ..... P17

```

- \* X. EXAMINE REMARKS FIELD
- \* THIS ROUTINE IS ENTERED ON EVERY CARD EXCEPT
- \* PAT AFTER FLO HAS APPEARED.
- \* THE PURPOSE IS TO SEND INFORMATION TO PASS 3
- \* FOR FLOWCHARTING. THIS INFORMATION IS
- \* TRANSMITTED AS A 'MADE-UP-MACHINE' OR MUM
- \* PSEUDOCODE. SPECIFICATIONS OF MUM GIVEN
- \* IN THE PASS 3 LISTING.
- \* X1. WHAT OK FIELD
- \* COLUMNS 32-35 ARE THE DOCUMENTATION KEY OR DK
- \* FIELD, AND THEY CONTROL THE FLOWCHARTING OPER
- \* ATION.
- \* IF THE DK FIELD IS BLANK, GO TO X2.
- \* IF IT IS G, BLANK IT OUT AND GO TO P17.
- \* G IS USED TO PUT REMARKS ON THE ASSEMBLY
- \* LISTING.
- \* IF IT IS CODI, THIS IS THE BEGINNING OF THE
- \* WORDS CODING DETAILS. TO X3.
- \* IF IT IS TABI, THIS IS THE BEGINNING OF THE
- \* WORDS TABLE OF CONTENTS. COMPILE THE DK
- \* FIELD AS AN O3 OP IN MUM CODE. THIS SPECIAL
- \* CASE IS EXAMINED BY PASS 3, THEN GO TO X3.
- \* IF IT IS THE FORM K, THIS INDICATES A NEW
- \* SECTION WITH KEY K. GO TO X6.
- \* IF IT IS OF THE FORM KN, OR KNN, IT IS A NEW
- \* SUBSECTION NAME. CHECK THAT THEY ARE NUM-
- \* BERED SEQUENTIALLY AND IF NO ERROR GO TO X4.
- \* ANYTHING ELSE IS A CONDITION NAME. TO X5.
- \* X2. SCAN FOR #
- \* LOOK THROUGH ALL REMARKS FOR A NUMBER SIGN.
- \* GATHER TOGETHER THE SHARACTERS FOLLOWING IT,
- \* UP UNTIL THE NEXT CHARACTER WITH UNDIGITS.
- \* THE PRINTING CHARACTERS + AND / ARE NOT
- \* DELIMITERS, THE OTHERS ARE.) THIS FORMS THE
- \* BRANCH WORD. IF NO CONDITION PRECEDED,
- \* COMPILE AN O9 OP. IF THE BRANCH WORD REFERS
- \* TO THIS CHART, PUT M AND C INTO THE LAST
- \* COMPILES INSTRUCTION. PUT A RECORD FOR THIS
- \* ENTRY AND N IN THE STOP TABLE AS THE LAST
- \* BRANCH TO M. OTHERWISE, COMPILE THE BRANCH
- \* WORD INTO THE MUM CODE.
- \* X3. TRANSFER REMARKS
- \* IF THE REMARKS AREN'T ALL BLANK, COPY THEM
- \* ONTO THE COMMENTS TAPE 7. GO TO P17 UNLESS
- \* DK FIELD WAS X, IN WHICH CASE WE GO TO
- \* E1 DIRECTLY.
- \* X4. COMPILE O1 OP
- \* COMPILE AN O1 OP FOLLOWED BY THE LINE NUMBER,
- \* AND TRANSFER THE SUBSECTION NAME, COLUMNS
- \* 32-60, TO THE MUM CODE AREA AND THE COMMENTS
- \* TAPE ALSO. TO P17.
- \* X5. COMPILE CONDITION
- \* BLANK OUT THE DK FIELD. IF COLS 36-40 ARE
- \* BLANK THIS INDICATES A BRANCH TO THE NEXT
- \* SECTION SO AN O8 OP IS SELECTED. OTHERWISE

THE LAST OP COMPILED IS INCREASED BY 1.  
IF IT WAS AN 01, SELECT OP 06 ELSE SELECT  
OP 05. FINALLY COMPILE THE SELECTED OP  
FOLLOWED BY THE CONDITION NAME. GO TO X2  
TO SCAN THE REST OF THE REMARKS.

X6. FINISH PREV SECTION  
COMPILE 03 OP AND THEN PUT OUT A  
SENTINEL ON THE COMMENTS TAPE. WRITE THE  
STOP TABLE FOLLOWED BY ALL THE MUM CODE  
ON THE CONTROL TAPE 6. THERE IS ROOM FOR  
ABOUT 1500 LINES OF MUM CODE.

X7. INITIALIZE  
RECORD THE NEW KEY LETTER SKIP TO THE NEXT  
PAGE ON THE ASSEMBLY LISTING.  
WRITE THIS LINE ON THE COMMENTS TAPE AND  
RETURN TO P17.

```

      (----IN----)
      |
      | 0(.....)0
1546  |
      |-----|
      | B1. CHECK INPUT TAPE | HOLD.....)0
      |-----|
      | GO! |
      |
1550  |
      |-----|
      | B2. READ BLOCK |
      |-----|
      |
      |
1564  |
      |-----|
      | B3. INITIALIZE |
      |-----|
      |
      |
1604  |
      |-----|
      | B4. OUTPUT GETS LOADER |..... E1
      |-----|

```

```

* B. BEGINNING OF ASSEMBLY
* B1. CHECK INPUT TAPE
*   IF INPUT TAPE ISNT READY,HALT AND RETURN
*   TO B1.
* B2. READ BLOCK
*   READ IN FIRST BLOCK INTO INPUT BUFFER
*   UNLOAD FIRST TAPE BUFFER AND INITIATE
*   READING SECOND BLOCK. THE INPUT TAPE IS
*   ALWAYS READING ONE BLOCK AHEAD. THERE MUST
*   THEREFORE BE AN EXTRA HASH BLOCK AFTER THE
*   ENDING SENTINEL.
*   EACH TAPE BLOCK CONTAINS 10 LINES.
* B3. INITIALIZE
*   SET LOWER CORE AVAILABLE
*   SET BLANK ADDRESS UNDEFINED
*   SET FLO MODE OFF
*   SET LINE COUNTERS TO ZERO
*   SET FORWARD AND BACKWARD LOCAL TABLES
*   (I AND J TABLES) TO UNDEFINED.
*   SET DRUM STATUS SO THAT 0001 TO 4999
*   ARE AVAILABLE
*   SET HHH BLANK.
* B4. OUTPUT GETS LOADER
*   WRITE LOADING ROUTINE ON OUTPUT TAPE.
*   NEITHER TAPE IS EVER REWOUND BY THE PROGRAM.
*   WE ARE NOW READY TO TAKE OFF,GOING TO E1.
*

```

(---IN---)

1609

Z1. FIND\* M.

1612

Z2. ASSEMBLE TRANSFER

1616

Z3. CLEAN OUTPUT BUFFER.

1621

Z4. EJECT PAPER

1623

Z5. FINISH FLO

1627

Z6. HALT

1629

Z7. FLOWCHARTING

NO. .... LOAD

YES! ..... PASS3

- \* 2. ENDING OF ASSEMBLY.
- \* Z1. FIND\* M.
- \* FIND M. IF UNDEFINED, HALT AND THE OPERATOR
- \* IS SUPPOSED TO FILL RA WITH THE RIGHT THING.
- \* Z2. ASSEMBLE TRANSFER
- \* ASSEMBLE HLT HHHH MLOC INTO LOCATION 0105
- \* WHICH WILL CAUSE THE LOADING TO STOP WITH
- \* THIS INSTRUCTION.
- \* Z3. CLEAN OUTPUT BUFFER.
- \* WRITE THE LAST BUFFER LOAD ON THE OUTPUT
- \* TAPE. PRINT THE END LINE AND THE ERROR
- \* INDICATION ON THIS LINE IS BLANK IF AND ONLY
- \* IF NO ERRORS OCCURRED DURING ASSEMBLY.
- \* Z4. EJECT PAPER
- \* SKIP THE PRINTER PAPER ABOUT 2 PAGES AHEAD.
- \* Z5. FINISH FLO
- \* FINISH PROCESSING THE LAST SECTION OF FLOW-
- \* CHART, IF ANY (SEE X6, EXCEPT COMPILE
- \* 04 INSTEAD OF 03 OP).
- \* Z6. HALT
- \* HALT THE COMPUTER, PASS 2 IS FINISHED.
- \* Z7. FLOWCHARTING
- \* IF NOT FLOWCHARTING, LOAD THE ASSEMBLED
- \* PROGRAM. IF FLOWCHARTING, GO ON TO PASS3.